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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

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CONTENTS

COVER: The M/S Davydov and the M/S Sovietsk, two new Soviet refrigerated fish carriers ordered by V/O Sudoimport, Moscow, from a Copenhagen shipyard. The vessels are designed to dress and freeze fish which are taken aboard by way of a stern chute from accompanying trawlers. (See p. 88 of this issue.)

Page
1 . .A Trawling Survey of Southern Lake Michigan (August-November 1960), by William G. Gordon
7 . .Gulf States Shrimp Canning Industry, by F. Bruce Sanford, Charles F. Lee, and Travis D. Love

Page
TRENDS AND DEVELOPMENTS:
Alaska:
15 . . New Dungeness Crab Operation in Southeastern Alaska
15 . . Herring in Good Abundance in Southeastern Alaska
15 . . Gains Seen in 1962 Catches of Several Fisheries
Alaska Fisheries Investigations:
16 . . Converted Oceanographic Vessel
16 . . Pink Salmon Egg Mortality in Little Port Walter
17 . . King Crab Tags Recovered in Shumagin Island Area
17 . . Record Migration Distances for Salmon Revealed in Yukon River Studies
17 . . Experiments to Influence Red Salmon Choice of Home Streams
17 . . Olsen Bay Pink Salmon Egg Loss High from Overspawning
American Fisheries Advisory Committee:
18 . . Committee Asks Effort to Meet World Fisheries Competition
California:
18 . . Pelagic Fish Population Survey Continued
20 . . Petrale Sole Tagging and Bottomfish Survey off Southern California
21 . . Preseason Sampling of Dungeness Crab Population off Central California Indicates Another Poor Season

Page
TRENDS AND DEVELOPMENTS (Contd.):
21 . . Cans--Shipments for Fishery Products, January-October 1962
Central Pacific Fisheries Investigations:
22 . . Feeding Behavior of Skipjack Tuna Studied
23 . . Seasonal Availability of Hawaiian Skipjack Tuna May Be Predicted from Studies of Oceanographic Climate
23 . . Research Vessel Scouts for Skipjack Tuna East of Hawaii
Composition of Fishery Products:
24 . . New Method for Determining Phosphorus in Fishery Products
Crabs:
24 . . Low Blue Crab Catch Predicted in Chesapeake Bay for 1962/63 Winter
Delaware River Basin:
25 . . Cooperative Federal-State Study Yields Data on Fisheries Resources
Frozen Fish:
25 . . Patent Granted for Chemical Solution that Reduces Drip
Fur Seals:
26 . . Alaska Skins Appraised Prior to Letting Processing Contract
Great Lakes Fisheries Explorations and Gear Research:
27 . . Trawl Fishing Explorations of Southern Lake Michigan Completed for 1962

Contents continued page II.

CONTENTS (CONTINUED)

Page

TRENDS AND DEVELOPMENTS (Contd.):
Great Lakes Fishery Investigations:
30 .. Spawning of Whitefish in Apostle Islands Area of Lake Superior Surveyed
30 .. Spawning Habits of Lake Herring and Chubs Surveyed in Apostle Islands Area
Gulf Exploratory Fishery Program:
31 .. Seasonal Distribution of Royal-Red Shrimp and Hard Clams Surveyed in Gulf of Mexico
Gulf Fishery Investigations:
32 .. Shrimp Fishery Program
34 .. Behavior Program
35 .. Estuarine Program
36 .. Industrial Fishery Program
37 .. Contract Research
37 .. Pink Shrimp Stained and Released for Mortality Studies
37 .. Shrimp Distribution Studies in Gulf of Mexico
Gulf of Mexico:
38 .. Fisheries Landings, 1961
Industrial Fishery Products:
39 .. Oxidation of Fish Oils Slowed by Addition of Phospholipids to Antioxidant
U. S. Fish Meal and Solubles:
40 .. Production and Imports, January-November 1962
U. S. Fish Meal, Oil, and Solubles:
40 .. Major Indicators for U. S. Supply, December 1962
41 .. Production, December 1962
41 .. Production, January-November 1962
Irradiation Preservation:
42 .. Joint Irradiation Studies on Crab Meat and Other Fish Products Under Way in Seattle
42 .. New Contract Includes Studies on the Preservation of Cod, Pollock, and Ocean Perch by Low-Level Irradiation
43 .. Atomic Energy Commission Approves Expansion of Studies on Fishery Products
New England Fisheries:
43 .. Bottomfish and Sea Scallop Fisheries Yield Forecast for 1963
Oceanography:
44 .. Sea Surface Temperatures Collected by Airborne Infrared Radiometer
45 .. Second Research Vessel Launched by Coast and Geodetic Survey
Oregon:
46 .. Regulations on Shrimp and Bottom Fishing for 1963
46 .. Record Number of Silver Salmon Eggs Taken by Hatcheries in 1962
Pollution:
47 .. Michigan Selected as the Site for New Water Pollution Field Laboratory
Salmon:
47 .. 1963 Fraser River Catch Forecast
48 .. Pacific Coast States from Interagency Council to Save Dwindling Stocks
Shellfish:
48 .. New York City Proposes Registration Fees for Shippers and Processors of Shellfish
Shrimp:
48 .. United States Shrimp Supply Indicators, December 1962

Page

TRENDS AND DEVELOPMENTS (Contd):
South Carolina:
49 .. Fisheries Biological Research Progress, September-December 1962
Swordfish:
51 .. New Long-Line Fishery off Southern New England Shows Promise
Tuna:
51 .. Tagging Program
52 .. U. S. Canned Pack, 1961-1962
U. S. Fishing Vessels:
53 .. Fisheries Loan Fund and Other Financial Aid for Vessels, October-December 1962
54 .. New Large Steel Trawler Added to Boston Fleet
U. S. Foreign Trade:
54 .. Airborne Imports of Fishery Products, Third Quarter 1962
55 .. Edible Fishery Products, November 1962
55 .. Imports of Canned Tuna in Brine Under Quota
Wholesale Prices:
56 .. Edible Fish and Shellfish, December 1962
FOREIGN:
International:
European Economic Community:
57 .. St. Pierre Fishing Base Plans Take Shape
European Free Trade Association:
57 .. Committee Weighs Further Tariff Cuts
Europe:
58 .. European Fish Producers Association (EUROPECHE) Plans for Future
Fish Meal:
58 .. World Production, October 1962
Fish Oil:
59 .. European Market Improved in December 1962
Food and Agriculture Organization:
59 .. Southwest Atlantic Regional Fisheries Advisory Commission Meets
Joint United States-Japan Committee on Trade and Economic Relations:
60 .. Second Meeting Held in Washington
International Labor Organization:
61 .. Fishing Industry Work Rules Discussed at Geneva Meeting
Organization for Economic Cooperation and Development:
62 .. Fifth Meeting of Fisheries Committee
62 .. Publication Issued on Sanitary Regulations for Fishery Products
Australia:
63 .. Aid for Fisheries Proposed by Government
Belgium:
63 .. Filleting Machine Developed for Herring and Pilchard
British Solomon Islands Protectorate:
64 .. Fisheries Development, 1962
Canada:
64 .. Studies Aim to Prevent Gluts in Newfoundland's Summer Cod Fishery
65 .. British Columbia Herring Price Dispute Settled
66 .. Scientists Study Chemistry of the North Atlantic Lobster
66 .. Rebirth of Nova Scotia Whaling Industry Stimulates Study of Whale Oils

Contents continued page III.

CONTENTS (CONTINUED)

Page

FOREIGN (Contd.):

Colombia:
67 .. Certain Types of Fishing Gear Banned in Coastal Waters

Denmark:
67 .. New Commercial Cold-Storage Facilities in Liberia and Nigeria Planned

France:
67 .. Imports of Japanese Frozen Tuna
67 .. Shipyards Get Korean Order for 160 Fishing Vessels

French Guiana:
68 .. Two United States Firms to Develop Shrimp Fishery of French Guiana

French Polynesia:
68 .. Improvement of Fisheries Planned

German Federal Republic:
69 .. Fisheries Research Laboratories

Ghana:
70 .. Fisheries Bill Stirs Debate on Foreign-Owned Tuna Base

Guatemala:
70 .. Shrimp Exports Increased Sharply in 1962

Honduras:
71 .. United States Firm Enters Shrimp and Spiny Lobster Fisheries

Iceland:
71 .. Herring Fishing Contract Dispute Settled

Iran:
71 .. New Company to be Formed to Operate in Persian Gulf

Italy:
72 .. Frozen Tuna Import Quota

Ivory Coast:
72 .. Fishing Industry Expands
72 .. New Fishing Port Offers Investment Opportunity

Japan:
73 .. Albacore Tuna Prices in Fall 1962 Remained Firm
73 .. First Winter Albacore Landing
73 .. Tuna Ex-Vessel Prices at Tokyo
74 .. Frozen Tuna Market Forecast for Europe, 1963
74 .. Restrictions on Indian Ocean Tuna Transshipment Ports Removed
74 .. New Tuna Vessel Construction
75 .. Tuna Landings by Mothership from South Pacific Area, 1950-1960
75 .. Tuna Vessel to be Equipped with Brine Tank
75 .. Bottomfish Factoryship Operations in Bering Sea, 1962
76 .. Government to Finance Shrimp Base in North Borneo
76 .. Tests with Power Block Encouraging

Jordan:
77 .. Increase in Landings of Fish Expected

Republic of Korea:
78 .. Fisheries Literature Needed by Libraries
78 .. Development of Frozen Shrimp Export Industry
79 .. Landings of Marine Products, 1951-1961, and Size of Fishing Fleet, 1954-1961
79 .. Production Status of New Agar-Agar Plants

Page

FOREIGN (Contd.):

Malaya:
80 .. Canned Tuna in Brine Exports to U. S.
80 .. Joint Malayan-Japanese Tuna Company Receives Financial Aid

Mexico:
81 .. Direct Taxes on Frozen Shrimp Exports
81 .. Soviet Fishing Vessels Attached to the Cuban Fleet Enter Mexican Port for Supplies

Morocco:
82 .. Exports of Sardines to France May be Restricted

Nicaragua:
82 .. Fishing Licenses Granted Two Caribbean Coast Companies

Norway:
82 .. Exports of Canned Fish, January 1-September 22, 1962
83 .. Fisheries Research Vessel Explores Waters off West Greenland

Pakistan:
84 .. Fish Harbor on Bay of Bengal to be Built

Peru:
84 .. Fish Meal Marketing Procedures
85 .. Fisheries Trends, Third Quarter 1962

Philippine Republic:
85 .. Improvement of Fishing Industry Stressed by President
86 .. U. S. Freshwater Fish Biologist Accepts FAO Assignment

Poland:
86 .. Landings of Marine Products and Size of Fishing Fleet, 1961
87 .. Long-Range Fishery Plans Call for Wide-Ranging Fleet of Vessels

South Africa Republic:
87 .. Legislation to Extend Territorial Waters Proposed

Switzerland:
88 .. Fish-Scaling Machine Developed
88 .. Watch for Divers

U. S. S. R.:
88 .. Landings of Fishery Products Surpass Goal in 1962
88 .. Two More Fish Freezing Vessels Christened in Danish Shipyard

United Kingdom:
89 .. Fishery Loans Interest Rates Revised
89 .. Fish Sticks Accepted by Consumers

Zanzibar:
90 .. Fisheries Development Company to Seek Export Markets

FEDERAL ACTIONS:

Department of Health, Education and Welfare:
Food and Drug Administration:
91 .. Policy on Packaged Products "Weighed at Time of Sale" Affects Fish Fillets

Department of the Interior:
Fish and Wildlife Service:
92 .. Program Review Assistant to Commissioner Named

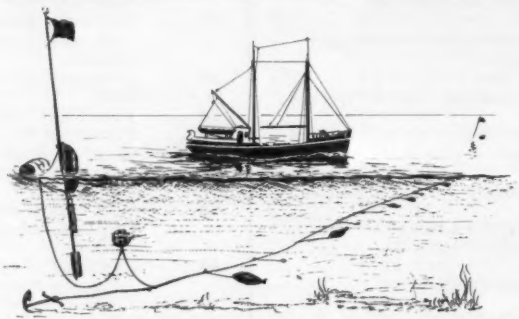
Bureau of Commercial Fisheries:
92 .. Regulations for Issuance of Desist Orders Against Possible Restraint of Trade by Fishery Cooperatives

Contents continued page IV.

CONTENTS (CONTINUED)

Page
FEDERAL ACTIONS (Contd.):
Interstate Commerce Commission:
94 .. Federal Court Enjoins Enforcement of Ruling on Cooked Vegetables
Department of Labor:
Wage and Hour and Public Contracts Division:
94 .. Tuna Cannery Workers Not Included in Wage Order Program for Puerto Rico Industries
Department of the Treasury:
Coast Guard:
94 .. Renewal of Motorboat Numbers Issued
94 .. Eighty-Eighth Congress (First Session)
FISHERY INDICATORS:
99 .. Chart 1 - Fishery Landings for Selected States

Page
FISHERY INDICATORS (Contd.):
100 .. Chart 2 - Landings for Selected Fisheries
101 .. Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products
102 .. Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers
102 .. Chart 5 - Fish Meal and Oil Production - U. S. and Alaska
103 .. Chart 6 - Canned Packs of Selected Fishery Products
104 .. Chart 7 - U. S. Fishery Products Imports
RECENT FISHERY PUBLICATIONS:
105 .. Fish and Wildlife Service Publications
107 .. Miscellaneous Publications



Typical vessel and gear used for halibut fishing in the North Pacific.

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* * * * *

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February 1963 Washington 25, D. C. Vol. 25, No. 2

A TRAWLING SURVEY OF SOUTHERN LAKE MICHIGAN (AUGUST-NOVEMBER 1960)

By William G. Gordon*

SUMMARY

Otter-trawl explorations in southern Lake Michigan were made in the latter half of 1960 by the U. S. Bureau of Commercial Fisheries. The fishing was carried out with vessels chartered from the Lake Michigan trawl fleet. Objectives of the investigation were to determine: commercial availability of fish to bottom trawls; seasonal distribution of the fish stocks; and the location and extent of areas suitable for fishing with conventional otter trawls.

A total of 134 otter-trawl drags was made at depths ranging from 5 to 45 fathoms around the southern perimeter of the lake from Ludington, Mich., on the east shore to Sturgeon Bay, Wis., on the west shore. Gear damage was light throughout the area. Weather and sea conditions were generally favorable.

Mixed catches of chubs, alewife, and smelt ranged as high as 1,200 pounds per 30-minute drag. Those fish were found most consistently at depths of 15 to 30 fathoms and dominated all catches. Yellow perch and whitefish were taken in limited amounts in drags at depths of less than 35 fathoms. Other fish of commercial importance were not taken in significant amounts.

INTRODUCTION

The traditional gill-net fishery of Lake Michigan has been in economic distress for the past several years. This condition developed as the more valuable species were reduced in number (primarily from sea lamprey depredation). The greatly increased populations of low-value species presently occupying the lake cannot be profitably harvested by gill nets. Progressive members of the fishing industry have sought ways of easing this situation through the development of more economical methods of production.

A limited trawl fishery for chubs, smelt, and alewife began in Wisconsin waters in 1958. It expanded to Indiana waters in 1959 and Michigan waters in 1960. Information regarding the commercial availability of chubs, alewife, smelt, suckers, and other underutilized fish was urgently needed before nearby industrial markets could be interested in developing uses for the fish. The fishing industry requested investigations to determine the seasonal distribution of fish stocks available to otter trawls and the location of suitable trawling bottoms.

The U. S. Bureau of Commercial Fisheries conducted 1-week exploratory cruises in August, September, October, and November of 1960. Systematic operations were conducted in predetermined areas and depths, with major emphasis on determining the depth distribution of the major chub species, alewife, and smelt.

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U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
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DESCRIPTION OF AREA SURVEYED

The 1960 explorations were conducted along approximately 400 miles of the southern Lake Michigan shoreline from Ludington, Mich., to Sturgeon Bay, Wis., at distances of up to 35 miles offshore. For discussion, the area of coverage has been subdivided into east and west sections. A total of 135 trawl stations were established--66 in the eastern section and 69 in the western section (fig. 1). Depths fished ranged from $9\frac{1}{2}$ to 42 fathoms. Most attention was given to the 15- to 40-fathom depth range.

BOTTOM CONDITIONS

EASTERN SECTION: The eastern section includes Lake Michigan east of longitude 87° W. and south of Ludington, Mich. With few exceptions, the bottom is composed of fine sand near shore. The sand grades to clay and soft mud as the depth increases. The gradual slope and regular contours of the lake bottom in most of the section provide excellent trawling bottom. Irregular clay bottom, boulders, and sandy shoals generally occur only at depths of less than 10 fathoms, except north of Michigan City, Ind., where numerous detached shoals create unfavorable trawling conditions out to about 15 fathoms. A limited amount of good trawling bottom exists in depths shallower than 10 fathoms, as widely-scattered and not well-defined patches.

WESTERN SECTION: The western section of Lake Michigan includes the area west of longitude 87° W. and south of Sturgeon Bay, Wis. A band of boulder deposits and bedrock outcrops, extending outward along most of the shoreline to depths of 5 to 15 fathoms, creates unfavorable inshore trawling conditions. The lake bottom beyond those depths consists mostly of sand, clay, or mud. Occasional patches of boulders and gravel impede trawling.

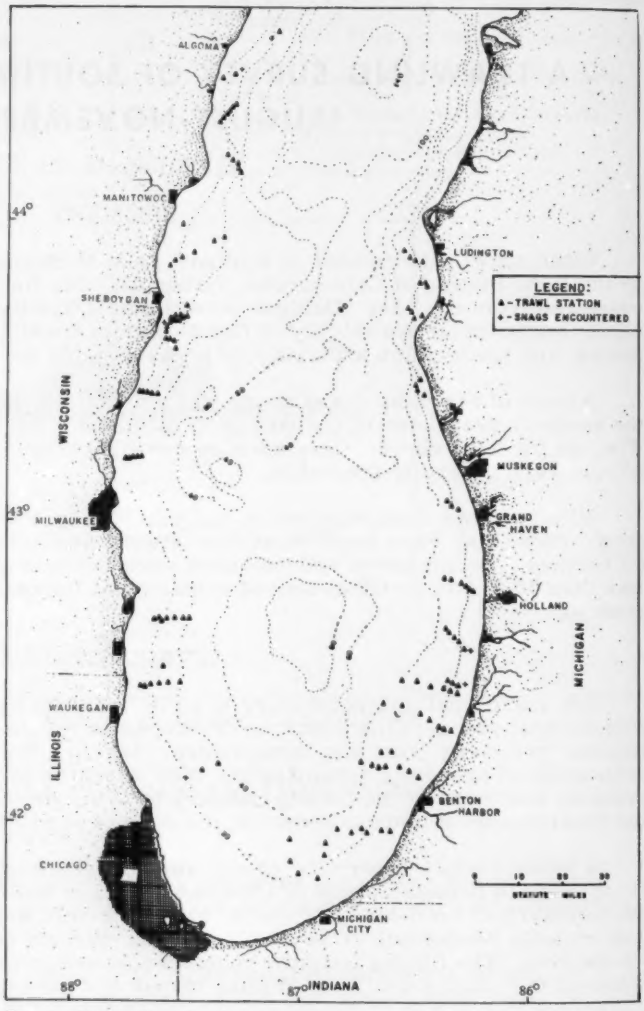

Fig. 1 - Geographic distribution of stations completed by the vessels Art Swaer II, Kevinbren, and Capitol I during 1960.

Although the slope becomes very steep in some places, the contours for the most part are regular, and trawling operations were carried out without difficulties. A number of snags were encountered on the steep slope off Sturgeon Bay, Wis.

South of Waukegan, the lake bottom inside the 15-fathom contour is dominated by rocky reefs and shoals. Little coverage was given to this zone because of the poor bottom and the presence of heavy shipping traffic.

LAKE CURRENTS

Variations in force and direction of currents affect fishing conditions in much of the area studied. The long north-south axis of the lake intensifies the effects of strong southerly or northerly winds, and current velocities may, on occasion, exceed 3 m.p.h. Local wind force and direction and barometric pressure cannot always be correlated with observed current patterns. Since speed, direction, and duration of the currents are variable, a constant check is necessary to maintain desirable trawling speeds.

VESSELS USED

Three commercial trawlers were chartered by the Bureau for the four exploratory fishing cruises: the Art Swaer II (August); Kevinbren (September and November); and Capitol I (October). All are engaged in the recently established Lake Michigan trawl fishery.

M/V "ART SWAER II": The Art Swaer II, home port Pensaukee, Wis., was originally built as a Lake Erie gill-net vessel. The vessel was converted for trawling in 1960 (fig. 2) The all-steel vessel is 60 feet over-all, has a 16-foot beam, is powered by a 150 hp. Diesel

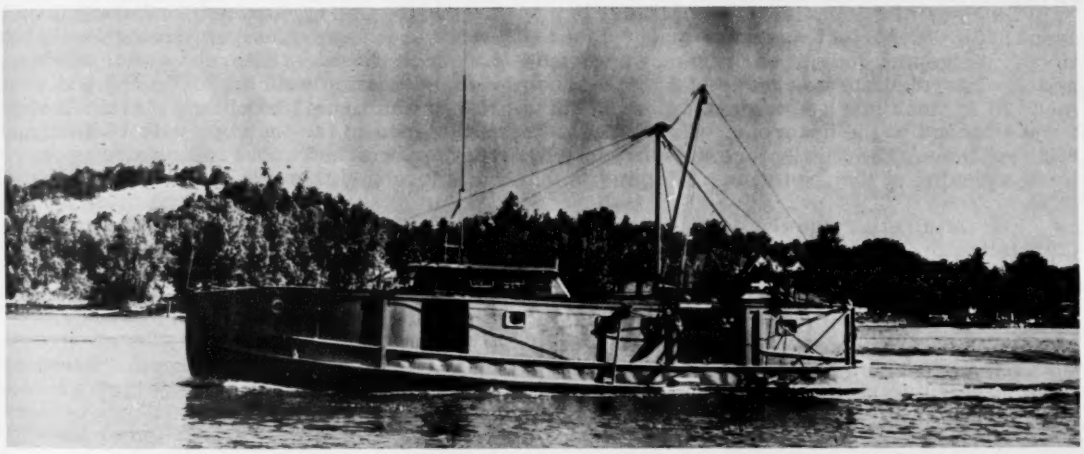

Fig. 2 - M/V Art Swaer II converted gill-net type vessel completed the first cruise of the research program.

engine, and is equipped with depth-sounder, automatic pilot, and radiotelephone. Unlike most converted United States gill-net vessels, the aft deckhouse was not removed. Deck machinery is driven from a main engine power take-off. The net is set out through the stern doorway and towed from two outrigger booms mounted on the mast. The catch is hauled through an enlarged doorway in the port side.

M/V "KEVINBREN": The Kevinbren, home port Milwaukee, Wis., was built in 1949 as a gill-net vessel for the Lake Michigan fishing fleet. It was rigged for trawling early in 1959 (fig. 3). This all-steel vessel has a total length of 57 feet and a beam of 14 feet. It is powered by a 165 hp. Diesel engine. Pilothouse equipment includes a depth-recorder, automatic pilot, and radiotelephone. The aft deckhouse has been removed. The deck machinery is driven by power take-off on the main engine. Arrangement of deck gear is similar to West Coast seiner-trawlers. The net is set and towed from the stern and the catch is hauled aboard over the starboard side.

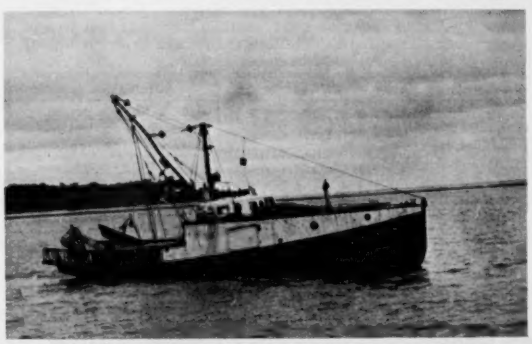

Fig. 3 - M/V Kevinbren, a converted gill-net type vessel used during a part of the explorations.

Fig. 4 - M/V Capitol I, 55-foot, former shrimp vessel chartered for the operations along the southern end of Lake Michigan.

M/V "CAPITOL I:" The Capitol I, home port Saugatuck, Mich., was built in 1959 at Houston, Tex., as a double-rigged shrimp trawler. Brought to Lake Michigan early in 1960, it was converted to a conventional stern trawler by removing the double rig and installing stern davits (fig. 4). The all-steel vessel is 53 feet in length and has a 15-foot beam and a 7-foot draft. It is powered by a 165 hp. Diesel engine. Deck gear is driven by power take-off on the main engine. Electronic equipment includes a depth-recorder, radiotelephone, and automatic pilot. The net is handled over the stern, and the catch is hauled over the starboard side.

GEAR AND METHODS

Two-seam balloon fish trawls similar to those used in the Gulf of Mexico (Gordon and Brouillard 1960), with 50-foot headropes and 60-foot footropes were used exclusively during the explorations. Wings and body of each trawl were made of $2\frac{1}{4}$-inch mesh[1/] 18-thread cotton webbing, and the intermediate was made of $1\frac{1}{2}$-inch mesh 15-thread cotton webbing. The cod end was made of $1\frac{5}{8}$-inch mesh 42-thread cotton webbing. Round aluminum and oblong plastic floats were attached to the headrope. Chain weights were fastened to the footrope with 10-inch manila droplines. The trawl doors measured $2\frac{1}{2}$ by 7 feet and weighed about 120 pounds each. A later widening of the iron runners from 4 to 7 inches increased this weight to about 160 pounds.

For the first cruise the doors were fitted with chain-towing bridles; and dandyline gear (consisting of 20-foot extension straps from the wing tips) was attached directly to the back quarter of the door near the top and bottom. In the remaining three cruises, bar brackets were used rather than bridles, and the dandyline gear consisted of two 10-fathom legs connected to the door with conventional V-D (Vigneron-Dahl) gear.

The warp to depth ratio used was 3:1. Towing speed averaged about 3 m.p.h. Drags were 30 minutes long unless bottom obstructions were encountered.

FISHING RESULTS

CHUBS: Various species of deep-water ciscoes (table 1) dominated catches in both sections at depths of 15 to 45 fathoms. Best fishing was in 20 to 30 fathoms. Small chub, mostly "bloater" chub (Leucichthys hoyi) generally composed over 90 percent of the chub catch (fig. 5). The extreme northern and

Table 1 - List of Common and Scientific Names of Fish Caught During Botton Trawling Explorations in Southern Lake Michigan, August-November 1960

Common Name	Scientific Name
Longjaw cisco	Leucichthys alpenae
Herring	Leucichthys artedii
Whitefish	Coregonus clupeaformis
"Bloater" chub	Leucichthys hoyi
Kiyi chub	Leucichthys kiyi
Shortnose cisco	Leucichthys reighardi
Shortjaw cisco	Leucichthys zenithicus
Yellow perch	Perca flavescens
Alewife	Alosa pseudoharengus
Smelt	Osmerus mordax
Burbot	Lota lota
Emerald shiner	Notropis atherinoides
Spottail shiner	Notropis hudsonius
Sea lamprey	Petromyzon marinus
Sculpins	Cottus sp.

1/All mesh sizes in this report are stretched measure.

Fig. 5 - A catch of chubs made during the explorations. This 800-pound catch is typical of those made in productive areas.

southern portions of the area covered were most productive, with chub catches averaging over 500 pounds per 30-minute drag. Chubs suitable for commercial smoking constituted 5 to 20 percent of the chub catch. These chubs ranged in size from 2 to 5 per pound.

ALEWIFE: Catches of alewife ranging from a few individuals to over 200 pounds per 30-minute drag were made in 10 to 30 fathoms. Best catches were obtained along the west shore at 20 to 25 fathoms.

The sporadic occurrence of alewife in the trawl catches indicates the possibility that commercial concentrations of this species may yet be located on other grounds or by midwater fishing during more intensive explorations.

SMELT: Commercial quantities of smelt were caught at widely scattered points and depths along the west shore; catches along the east shore consisted of 15 pounds or less. Catches from the west section contained as many as 170 pounds of smelt (10 to 20 per pound) per drag in the 15- to 25-fathom depth range.

OTHER FISH: Several other fish of commercial importance were taken in small amounts at various localities and depths. Yellow perch were caught in small numbers in 31 drags inside 35 fathoms. Two drags northeast of Waukegan in 14-20 fathom resulted in catches of 40 and 70 pounds of yellow perch; fishing at the other positions produced perch in amounts not exceeding 10 pounds per drag. Whitefish were caught in amounts of 15 pounds or less per drag at depths less than 20 fathoms at scattered locations along the east shore. Lake herring were taken in amounts of 5 pounds or less in 47 drags at all depths fished.

A few fish, presently of no commercial importance, were caught in small quantities. These included: sculpin in amounts of 2 pounds or less; and spottail shiner (a small minnow), also in amounts of 2 pounds or less.

CONCLUSIONS

Exploratory trawling during the second half of 1960 has demonstrated that commercially important concentrations of underutilized fish are present in most of southern Lake Michigan inside 45 fathoms and that commercial catches can be made with otter-trawl gear in most of the area surveyed. Although obstructions were encountered, the bottom appears relatively clear outside 10 fathoms and for the most part can be considered trawlable. The size of the potential fishery resource, in terms of continuing yield, is unknown. Year-round exploratory work will be required before the seasonal distribution of the various species can be determined and before areas and depths of highest production are delineated. The preliminary study suggests that a considerable amount of gear research will be required to determine the most effective gear for catching the fish.

Since the areas fished are scattered, the survey must be considered preliminary. Possibly heavier concentrations of fish may be located in other seasons and on other grounds, or other fish of greater economic value may be located in other areas, depths, or midwater levels.

APPENDIX

A detailed fishing log showing position, depth, date, catch components, and related data for each drag made by the vessels used is available as an appendix to the reprint of this article. Write for Separate No. 667, which includes the tables (2-5) for the 1960 fishing logs for the Lake Michigan survey: Table 2 - M/V Art Swaer II Cruise 1, August 10-17; Tables 3 - M/V Kevinbren Cruise 2, September 7-13; and 5 - Cruise 4, November 16-21; and Table 4 - M/V Capitol I, Cruise 3, October 11-16.

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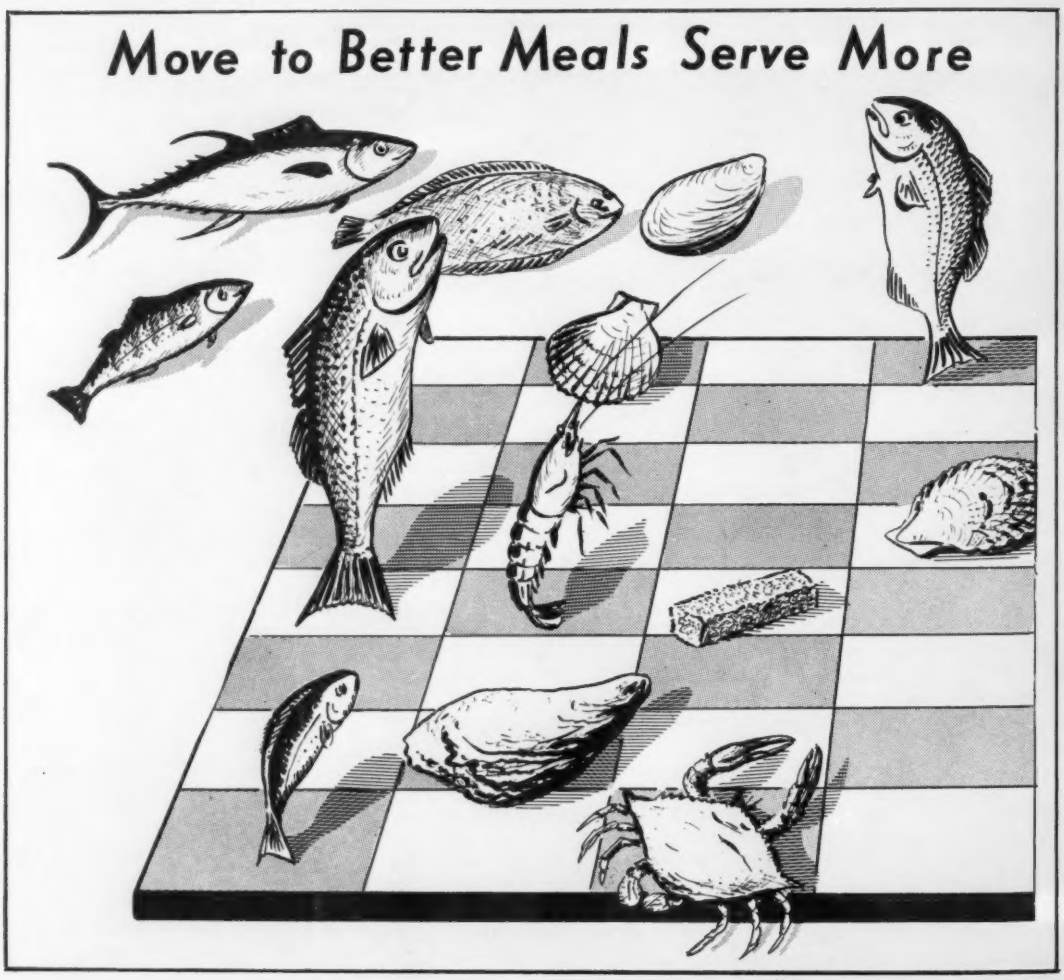

GULF STATES SHRIMP CANNING INDUSTRY

By F. Bruce Sanford*, Charles F. Lee**, and Travis D. Love***

Shrimp constitutes our most important fishery (table 1). This crustacean is sold frozen, canned, fresh, and dried. Frozen and canned shrimp bring the greatest revenue.

Table 1 - Value of the United States Catch, 1957-61

Year	Shrimp	Salmon	Tuna	Other	Total
	(Million $)				
1961	52	52	44	210	358
1960	67	45	37	204	353
1959	58	36	37	215	346
1958	73	46	45	210	373
1957	73	40	39	202	354

Table 2 - United States Canned Pack of Shrimp, 1961

States	Value of Pack
	Million $
Gulf:	
Louisiana	6.8
Mississippi	1.9
Alabama and Texas	1.0
Pacific:	
Alaska	1.8
Washington and Oregon	0.4
Total	12.0

The shrimp canning industry is located in the Gulf and Pacific states (table 2). Most of the production is in the Gulf states, with Louisiana being the principal source.

Although consumers are aware of the tastiness and convenience of the canned product, many are not aware of the ingenuity and care required in its manufacture. Home economists, restaurateurs, retailers, and others closely associated with consumers may also not be acquainted with those aspects.

The purpose of this article therefore is to report on the shrimp-canning industry in order to give an understanding of what is required to make canned shrimp available. Since the operations are somewhat complex for a verbal description, photographs are used to depict the various steps.

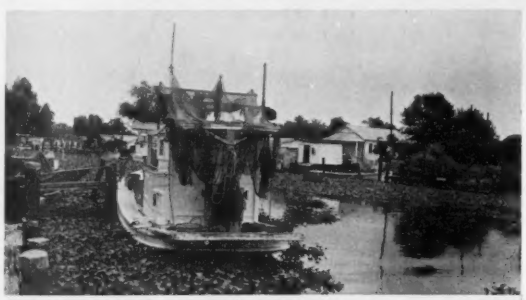

Fig. 1 - Small shrimp trawlers find use primarily in the day-boat fishery. (The water plants seen here are water hyacinths, which grow profusely in many waterways of the South.)

Fig. 2 - Shrimp trawlers vary not only in size but also in design. The vessel in the foreground is a Florida-type trawler with the house well forward. The vessel in back is of the Biloxi type.

Fig. 3 - Many of the larger trawlers are double-rigged so that they can drag two trawls simultaneously. Note the two pairs of trawl doors hanging from the rigging, one pair on each side of the vessel.

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U. S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
SEP. NO. 668

Fig. 4 - Shrimp and ice are shoveled from the hold into a conveyor-hopper. Depending on the location of the plant and on circumstances, shrimp are brought to the plant by either vessel or truck.

Fig. 6 - The shrimp are passed over an inspection belt, where debris and cull shrimp are removed.

Fig. 8 - The inspected shrimp are conveyed to a weighing basket, which holds 105 pounds or a half barrel of shrimp.

Fig. 5 - Ice is separated from the shrimp, and the shrimp are washed prior to being conveyed into the plant.

Fig. 7 - Shrimp may grow to large size.

Fig. 9 - Since the price paid to the vessel for shrimp varies with the size, random samples are counted to determine the average number of shrimp per pound.

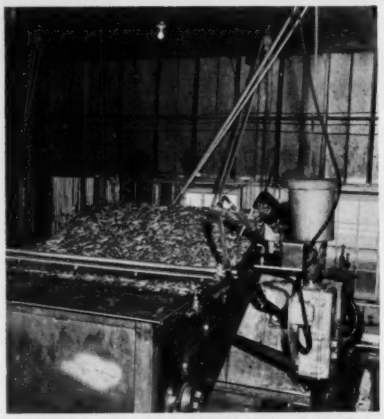

Fig. 10 - Shrimp are dumped into the hopper in the foreground and are carried by conveyor into a peeling machine.

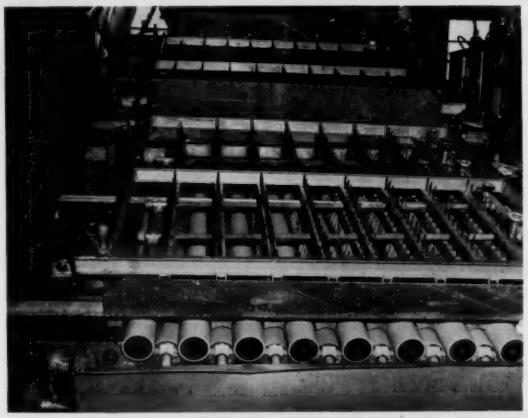

Fig. 11 - An oscillating motion of the rubber-covered rolls of this mechanical peeler assists in separating heads and shell from the softer meats of the shrimp.

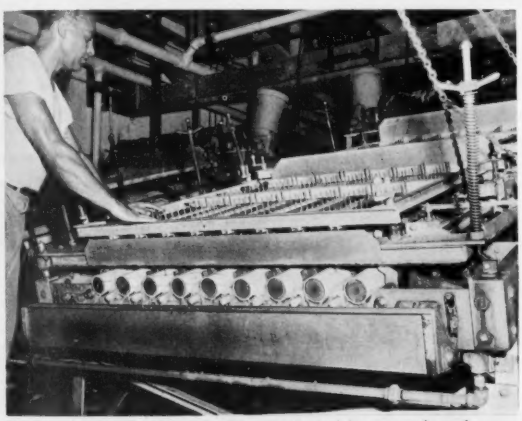

Fig. 12 - Alternately rising and falling mechanical fingers gently apply pressure to hold the shrimp against the soft rubber-covered rollers. A flow of water and the force of gravity carry the shrimp downward to the trough at the bottom end of the machine.

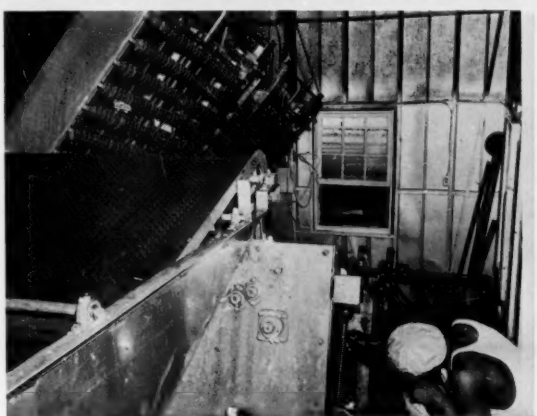

Fig. 13 - The opened machine shows the specially designed fingers that position the shrimp against the oscillating rollers for peeling.

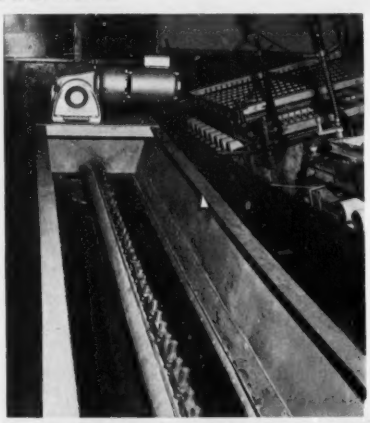

Fig. 14 - From the peeler, the shrimp pass to a scrubber, where an eccentric cam rotates rollers over the shrimp to loosen any material not removed in the peeler.

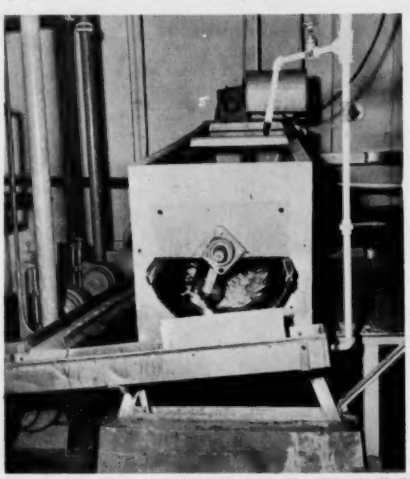

Fig. 15 - This view of the scrubber shows the rollers oscillating rapidly back and forth in a trough of running water.

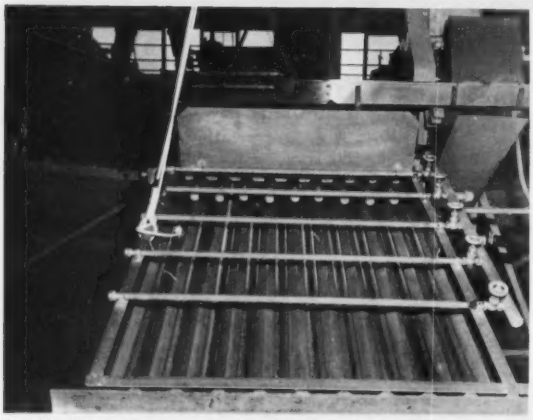

Fig. 16 - A separator removes the final bits of material loosened by the scrubber.

Fig. 18 - A screw conveyor elevates the shrimp to the top of the machine.

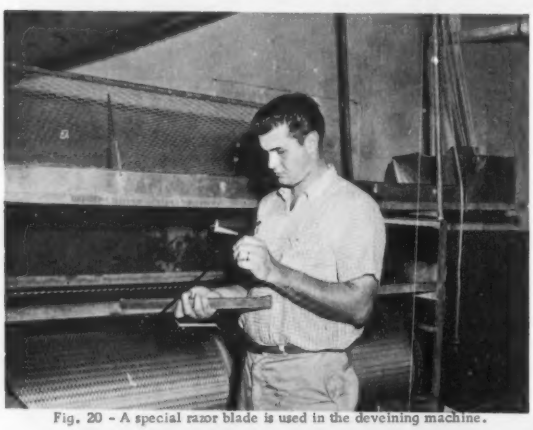

Fig. 20 - A special razor blade is used in the deveining machine.

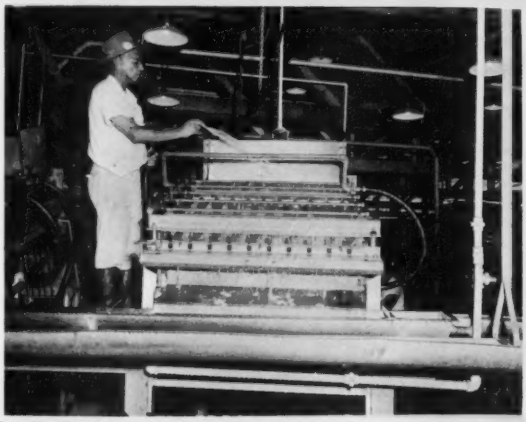

Fig. 17 - The shrimp drop from the end of the separator into a flume that transfers them to a deveining machine.

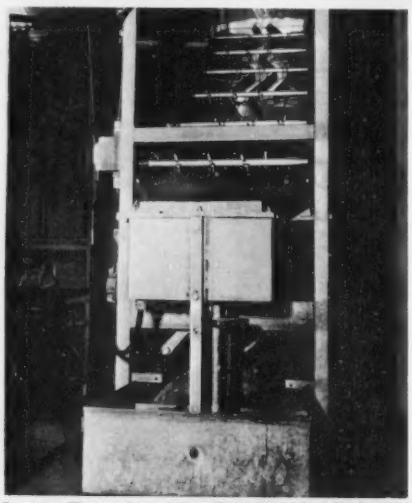

Fig. 19 - This machine removes the sand vein from the shrimp. The device has razor-sharp knife edges on the upper baffles to cut the back muscle of the shrimp in such a manner that the sand vein can be removed in the bottom rotating drum by sharp projections on its inner surface.

Fig. 21 - The angle of descent on the deveiner is adjustable.

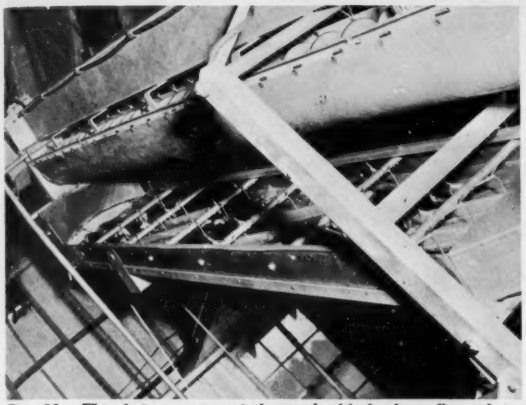

Fig. 22 - The shrimp are carried past the blades by a flow of water and the force of gravity.

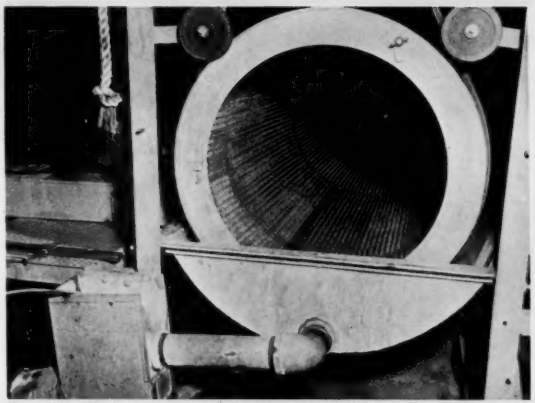

Fig. 23 - This is a view of the interior of the rotating drum for removing the sand vein.

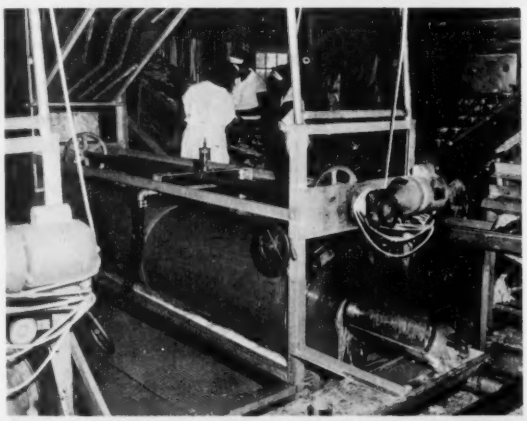

Fig. 24 - A carriage mounted on a screw supports a pressure hose that travels to an fro, washing the sand veins from the drum.

Fig. 25 - The shrimp are inspected prior to being cooked.

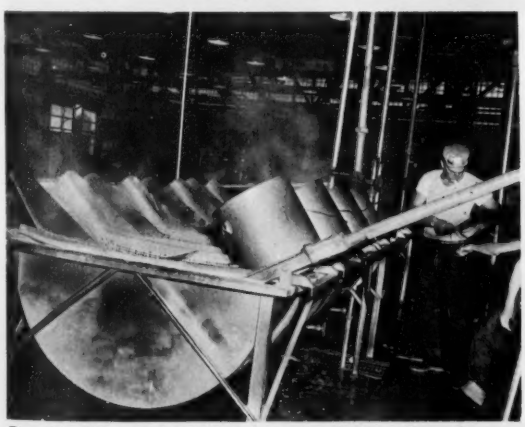

Fig. 26 - The cooking is done in a salt solution. Shown here is a batch cooker.

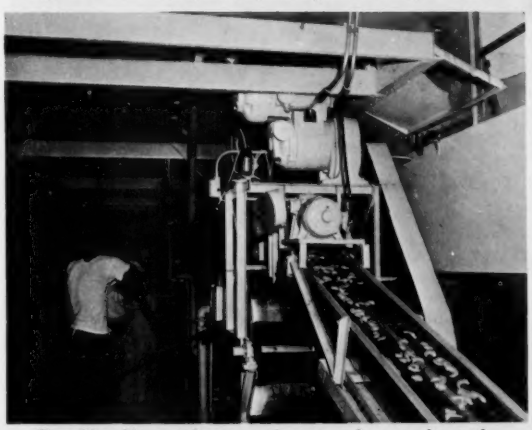

Fig. 27 - Alternately, a continuous cooker may be used.

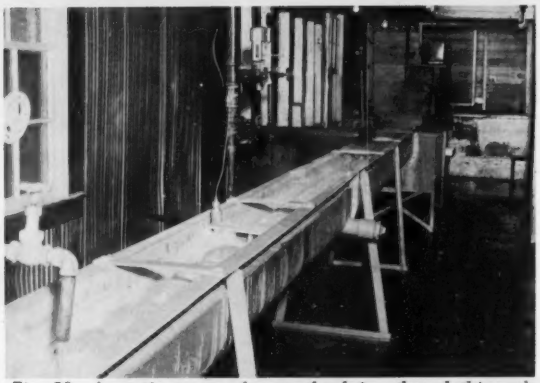

Fig. 28 - A rotating screw advances the shrimp through this cooker.

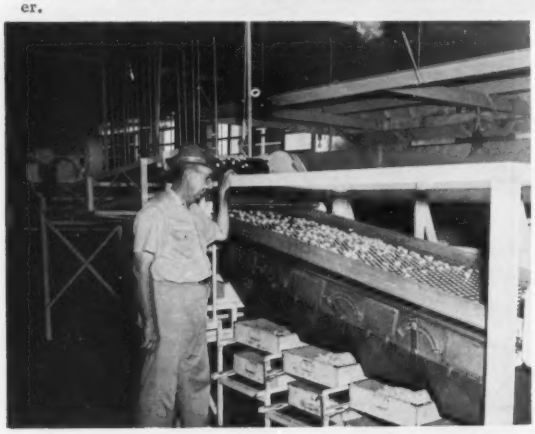

Fig. 30 - The shrimp are sized mechanically into the following groups: tiny, small, medium, large, jumbo, and colossal.

Fig. 32 - The cans are weighed by hand in order to meet the close tolerances required.

Fig. 29 - When the shrimp have been cooked, they are again inspected. After having passed through the cooker, they develop an attractive pink color and a characteristic curl. This curled shape not only is attractive, but use is made of it later in the mechanical grading of the shrimp for size. Also it is necessary to remove a portion of the moisture in order to get the proper amount in the can for required drained weight cut-out.

Fig. 31 - Broken shrimp are separated from the perfect ones.

Fig. 33 - The scales are designed for quick weighing.

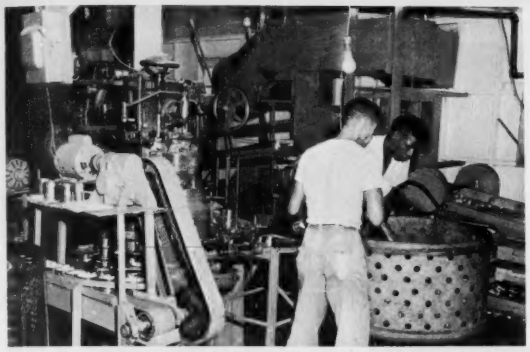

Fig. 34 - The cans are filled with a hot salt solution and are automatically sealed by machine. The salt solution, being hot, ensures a vacuum when the cans are cooled.

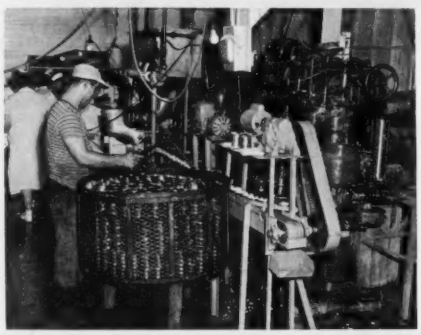

Fig. 36 - Use of a dolly permits the basket to be moved easily.

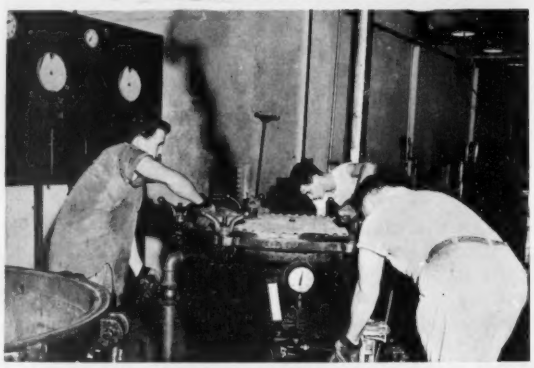

Fig. 38 - A cook is started in the retort, which holds the desired pressure automatically. Time, temperature, and pressure are recorded on the charts shown on the upper left.

Fig. 40 - The cans of cooked shrimp are immersed in cooling water. Cooling prevents the shrimp from becoming overcooked.

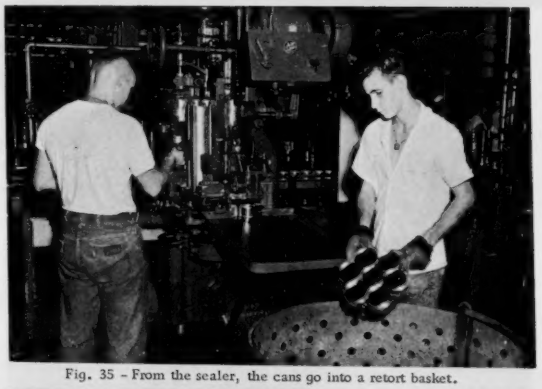

Fig. 35 - From the sealer, the cans go into a retort basket.

Fig. 37 - The basket is lifted into the retort with a power hoist.

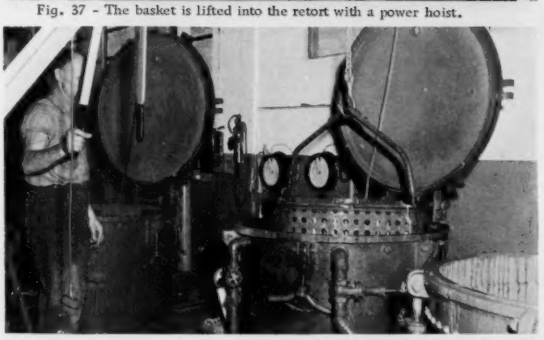

Fig. 39 - The power hoist again comes into use in removing the basket from the retort.

Fig. 41 - The processed cans are removed from the retort basket.

Fig. 42 - The unlabeled cans may be cased for storage, depending on the orders at hand.

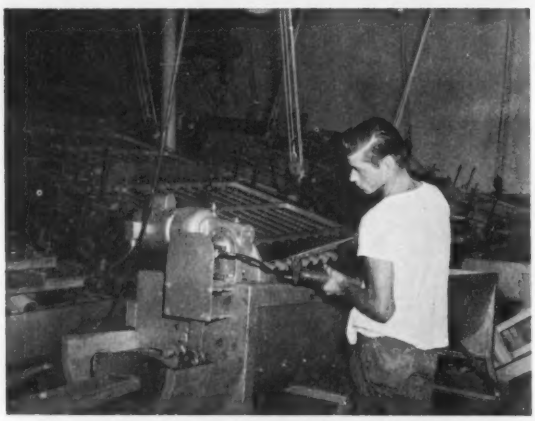

Fig. 44 - At the end of day, the machinery is carefully greased.

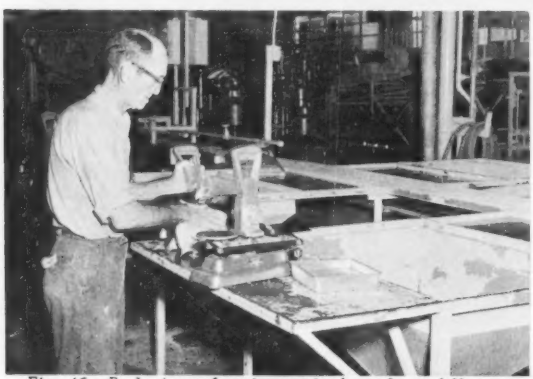

Fig. 46 - Each piece of equipment is cleaned carefully.

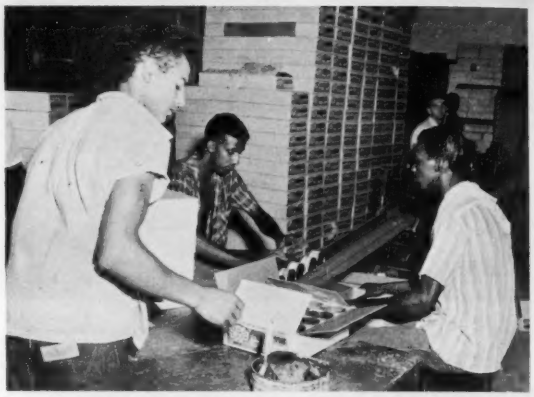

Fig. 43 - After the cans have passed through a labeling machine, they are packed into cartons ready for shipment to the consumer.

Fig. 45 - The equipment and the plant are thoroughly scrubbed with detergents and chlorine.

As the photographs show, the visitor to a plant for canning shrimp is impressed by the ingenuity and the care used in manufacture. Machines perform operations that persons unacquainted with American inventiveness would not think possible. Quality, however, is not left to mechanical devices: the product is inspected and reinspected in every step in the process. Utmost vigilance is used to ensure that every can of shrimp will be perfect.

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TRENDS AND DEVELOPMENTS

Alaska

NEW DUNGENESS CRAB OPERATION IN SOUTHEASTERN ALASKA:

A new Dungeness crab operation began in November 1962 at the village of Metlakatla. A company has been formed to process and ship fresh Dungeness crab meat to Seattle by air freight. Several boats from the village salmon fleet have been equipped with crab pots, but landings in November were small because of bad weather and inexperienced fishermen. Current plans are to fish the bays and inlets in the Ketchikan-Prince of Wales Island area and to avoid the more exposed waters of Dixon Entrance and Hecate Strait.

Lively dungeness crabs in a live well aboard a crab fishing boat.

* * * * *

HERRING IN GOOD ABUNDANCE IN SOUTHEASTERN ALASKA:

Although the single herring reduction operator in Southeastern Alaska took 14,000 tons of herring in the 1962 season, which was about half of the 1961 catch, the catch per unit of effort measured in boat-ton days was 1,340 pounds, the second highest since 1929. The 1958 year-class formed 80 percent of the catch taken in 1962.

* * * * *

GAINS SEEN IN 1962 CATCHES OF SEVERAL FISHERIES:

Alaskan fishermen have caught more salmon and halibut in 1962 than they did in 1961.

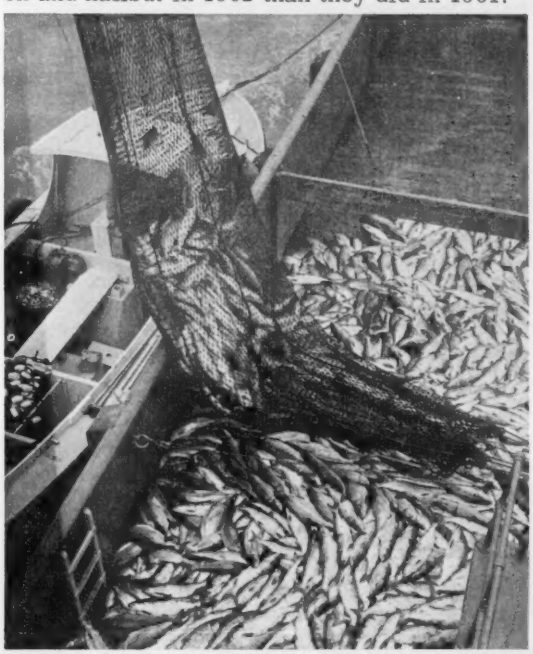

Fig. 1 - Brailing red salmon from gill net boat to buying scow in Bristol Bay.

It is apparent that record catches of king crab, shrimp, and probably Dungeness crab will have been taken when final data are available. On the basis of the reported pack of canned salmon, it has been estimated that the 1962 catch of salmon in Alaska totaled approximately 280 million pounds--15 million pounds more than in 1961. In 1962, the catch of halibut in Alaska totaled approximately 36 million

Fig. 2 - Shrimp being transported from landing dock to processing plant.

pounds (round weight), while in 1961 the catch was 33.4 million pounds. It is estimated that the catch of king crab in Alaska will top 50 million pounds; the record 1961 catch totaled 43.4 million pounds. The 1962 catch of Dungeness crab is expected to surpass the record catch of 5.5 million pounds taken in 1951. A catch of approximately 25 million pounds of shrimp in 1962 will exceed the record 1961 catch by about 9 million pounds.

Alaska Fisheries Investigations

The following is a report of the November-December 1962 activities and studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska.

CONVERTED OCEANOGRAPHIC VESSEL:

The Murre II is the latest tool adopted by the Biological Research Laboratory, Auke Bay, in its expanding oceanographic program in Alaska. The vessel completed its initial cruise, and during November analysis of data collected was begun.

The Murre II is a self-propelled power barge 86 feet long with a 24-foot beam. She is powered by twin caterpillar Diesel engines and will do 8 knots. The vessel is equipped with living accommodations for 9 people and 2 laboratories, one approximately 10 by 15 feet and the other about 8 by 16 feet. There are about 720 square feet of usable forward deck space, with limited working space on the stern.

The objectives of the Laboratory's oceanographic program for the first 2 or 3 years will be to conduct reconnaissance surveys of certain areas of Southeastern Alaska known to be important nursery grounds and migration routes of commercially valuable fish and shellfish and to describe the dominant properties of those marine environments.

* * * * *

PINK SALMON EGG MORTALITY IN LITTLE PORT WALTER:

A field party traveled to Little Port Walter aboard the vessel Heron in early November to continue observations on the abundance of

Enumerating pink salmon fry on their outmigration at Sashin Creek, Little Port Walter, in Southeastern Alaska.

dead 1961 brood-year pink salmon eggs in the Sashin Creek spawning beds at Little Port Walter. A sizable number of dead 1961 brood eggs equal to the number observed in mid-August was still present in late October, and plans are being made to sample again in the spring of 1963 to determine if 1961 brood-year eggs are present at that time. Large numbers of decomposing residual eggs in the spawning gravel could result in excess mortalities among the eggs of the next brood year.

Such a decrease in salmon productivity would argue for more accurate determination of optimum numbers of spawning fish and avoidance of overescapement as well as underescapement.

* * * * *

KING CRAB TAGS RECOVERED IN SHUMAGIN ISLAND AREA:

Only about 15 tags were collected in the Shumagin Island area, partly due to the limited fishery there. In contrast to the Kodiak king crab fishermen, fishermen in the Shumagin Islands and Alaska Peninsula areas are primarily salmon fishermen. Therefore, those king crab stocks are not as extensively fished as they are in the Kodiak area.

* * * * *

RECORD MIGRATION DISTANCES FOR SALMON REVEALED IN YUKON RIVER STUDIES:

Studies conducted by the Bureau in connection with the proposed Rampart Canyon project have resulted in the discovery of salmon migration unparalleled on the North American continent. In the Yukon River, the chinook or king salmon travel as far upstream as Nesutlin Lake in Yukon Territory, Canada, a distance of some 2,000 miles.

Chum or dog salmon have been observed at Teslin Lake in Yukon Territory, a distance of 1,735 miles from salt water. Only in the Amur River of Siberia are chums known to approach such far-distant movement to reach their spawning areas. Normally, chum salmon spawn relatively close to salt water. Because of the Yukon River chum's adaptation to this long distance migration journey, those chums are extremely fine fish, the meat being very deep orange in color and having a high content of oil to sustain the fish on the extended journey.

Cohos or silver salmon pass the proposed damsite beginning in late September, and apparently finish their ascent to the spawning areas under the ice during the winter months. Cohos tagged near the damsite in October have been recovered in December as far upstream as Old Crow, Yukon Territory, some 1,600 miles above the mouth of the Yukon. Reliable reports from Indians of Old Crow, located north of the Arctic Circle, indicate that cohos spawn in spring areas during February, an additional 200 miles further upriver than the recovery point of tagged fish.

In the 1962 agreement between the Department of the Army and the Department of the Interior it was agreed that the Department of the Interior shall initiate, in cooperation with the State of Alaska and interested Federal agencies, broad comprehensive studies of the effect of the Rampart project on all natural resources. This study shall be completed prior to any recommendations for authorization of the Rampart project. Preliminary discussions have been held with personnel of the Bureau of Reclamation District Office in Alaska, who have been assigned the responsibility of compiling and assembling this report for the Department.

* * * * *

EXPERIMENTS TO INFLUENCE RED SALMON CHOICE OF HOME STREAMS:

Experiments are proceeding at the Bristol Bay-Brooks Lake Station whereby sockeye salmon are subjected to morpholine which is being continuously introduced into Hidden Creek during the egg and fry stages. It is anticipated that this same chemical may be used to influence their choice of home streams when they return to spawn as adults. This will be tested by discontinuing morpholine in Hidden Creek and introducing it instead into a neighboring tributary. In the low winter temperatures, freezing of morpholine in certain pipe connections at the metering site on Hidden Creek required modifications of the butane heating system; however, the project in December was operating smoothly. If adult salmon runs can be attracted to other than their ancestral streams in this manner, a valuable management and research technique will be available.

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OLSEN BAY PINK SALMON EGG LOSS HIGH FROM OVERSPAWNING:

The exceptionally high pink salmon spawning run into the research stream at Olsen Bay in 1962 resulted in a loss of eggs after the maximum numbers successfully deposited had been reached. In the early stages of the run where there was little or no competition for space and the females could defend their redds, there was a fairly close agreement between actual and potential egg deposition. When the accumulated number of eggs buried

in the spawning bed reached approximately 3,600 per square meter, additional spawners started to dislodge as much as two-thirds as many eggs as they successfully deposited. The maximum number of eggs which were successfully deposited was about 4,200 per square meter. After all spawning had been completed, the number of eggs per square meter was about 3,300. While the loss of 900 eggs per square meter is attributed largely to the excess spawning activities, some flooding did occur and accounted for some of the losses.

American Fisheries Advisory Committee

COMMITTEE ASKS EFFORT TO MEET WORLD FISHERIES COMPETITION:

Five steps which would help American commercial fishermen meet the competition of foreign fishing fleets were outlined by the American Fisheries Advisory Committee at its meeting in Kansas City, Mo., in December 1962, the Department of the Interior reported on December 19.

The 20-member Committee was established in 1955 under the Saltonstall-Kennedy Act and includes leading representatives of the commercial fishing industry from all parts of the Nation. It advises the Secretary of the Interior on fishery matters.

Steps outlined by the Committee were:

1. Increased scientific and economic research of fisheries.

2. More authority for international commissions in fish management and harvesting.

3. Modernization of United States fishing vessels and shore installations to equal those of competing nations, vessel loans, grants, and mortgage insurance where such programs apply.

4. Improvement of production and marketing techniques to build a better knowledge of fishery products and better markets.

5. Development of untapped resources which exist in tremendous quantities.

Among other problems which were discussed at the three-day meeting (December 3-5) were the effects of pesticides on fish life, grading and inspection of fishery products, development of new fishing gear, and the importance of mid-America to the fishing industry as a major market for fishery products.

Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, opened the meeting by asking the committee to consider carefully the international implications involved in the conservation of the living resources of the sea.

Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, emphasized the political and economic impact which the European Economic Community, the Trade Expansion Act, and other major domestic and international developments are likely to have on this Nation's commercial fisheries consistent with yield.

Membership of the American Fisheries Advisory Committee includes Ammon G. Dunton, White Stone, Va.; J. Roy Duggan, Brunswick, Ga.; Thomas D. McGinness, Irvington, Va.; Roy Prewitt, Lonoke, Ark.; Ralph E. Carr, Kansas City, Mo; Harold F. Cary, Long Beach, Calif.; Chris Dahl, Petersburg, Alaska; George J. Davidson, Boston, Mass.; Louis Fischer, Cocoa, Fla.; Ray H. Full, Vermilion, Ohio; H. R. Humphreys, Jr., White Stone, Va.; Leon S. Kenney, St. Petersburg, Fla.; E. Robert Kinney, Gloucester, Mass.; John S. McGowan, Astoria, Oreg.; James McPhillips, Mobile, Ala.; John Mehos, Galveston, Tex.; Arthur H. Mendonca, San Francisco, Calif.; Anthony Nizetich, San Pedro, Calif.; Einar Pedersen, Seattle, Wash.; and Daniel H. Smith, Port Washington, Wis.

The next meeting will be in Washington, D. C., May 27-29, 1963.

Caliornia

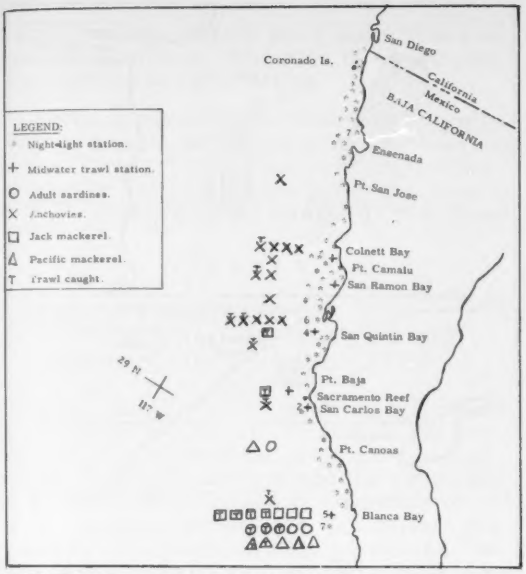
PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 62-A-6-Pelagic Fish (October 10-November 6, 1962): The coastal waters off the Pacific Coast of northern Baja California from Blanca Bay to the Coronado Islands were surveyed by the California Department of Fish and Game research vessel Alaska. The objectives were (1) to assess the strength of the 1962 sardine year-class and to determine the population density and distribution of adults; (2) to survey other pelagic

A Comparison of Trawl Catches with Light Station Catches from the Same Area

Area	Fishing Method	Station Number	Pacific Sardine	Northern Anchovy	Pacific Mackerel	Jack Mackerel	Pacific Round Herring	Jack Smelt	Pacific Pompano	California Barracuda	All Other Fish 1/	Squid
Blanca Bay	Trawl	I*	1			77						
		II*	2		9	4		6			2	1
		III		500			19		11		2	
		IV	255		4	2	2	1	150		32	
		V				1		16	36		11	7
	Light	1	500		1	88						
		2						5				
		3	17		23	4		400				
		4			1	5						
		5										
		6										
		7										
San Carlos	Trawl	VI*								220		
		VII		4 tons								
	Light	10										
Sacramento Reef	Trawl	VIII*				1					18	20
San Quintin Bay	Trawl	IX*										200
		X		500							5	
		XI		1,500		46			2		2	
		XII		3 tons								
	Light	27		5								1
		28										
		29										
		30										
		31										
		32		6,000								
		33		100								
San Ramon Bay	Trawl	XIII*		300							8	
	Light	40										
Colnett Bay	Trawl	XIV		200							1	
	Light	47		3								
		48										
		49		1								100

*Denotes daytime trawl, all others were made at night.
1/"All other fish" includes bat ray, California lizardfish, kelp pipefish, ocean whitefish, white croaker, queenfish, halfmoon, kelp perch, sharpnose seaperch, Pacific sanddab, California halibut, fantail sole, spotted turbot, honeyhead turbot, slim midshipman, and stargazer.



M/V Alaska Cruise 62-A-6-Pelagic Fish (October 19-November 6, 1962).

species for distribution, abundance, and age composition; (3) to continue testing a midwater trawl as a sampling device for pelagic species; and (4) to obtain live juvenile sardines for growth and scale studies.

The 1962 sardine year-class appeared to be very weak in the area. Fish-of-the-year were not observed or sampled at any of the 80 night-light stations occupied. Adult fish were absent except south of Pt. Canoas (see chart) where 3 samples were taken. Two of those were collected in Blanca Bay and were in the same size range (187-204 mm. or about 4.7-5.2 inches) as those found there on the previous cruise. The third sample was taken during daylight hours at Pt. Canoas. Several schools were seen there at sundown, but none was attracted to the night light.

No sardine schools were observed during 370 miles of night scouting. The sardine population in 1962 appears to be the lowest on record.

Northern anchovies were distributed over much of the survey area. They were present on 10 of 80 light stations and were taken in 7 of 14 midwater trawls. Twenty-seven schools were observed while scouting at night. Heavy local concentrations were present at San Carlos Bay, Pt. Camalu, Colnett Bay, and Pt. San Jose. Sizes ranged from pinheads (70-100 mm. or about 1.8-2.5 inches) to very large adults (130-144 mm. or about 2.5-3.3 inches). The pinhead size and an intermediate group (115-125 mm. or about 2.9-3.2 inches) comprised the bulk of the samples.

Jack and Pacific mackerel were unusually scarce. Four Pacific and 3 jack mackerel samples were collected at night-light stations in areas where sardines were also found.

Two additional samples of jack mackerel were caught by midwater trawling off Sacramento Reef and in San Quintin Bay. No school of either species was observed while night scouting.

Bonito were distributed over almost the entire survey area. They were most abundant in the area from Ensenada to the Coronado Islands where 39 schools were observed.

In order to compare night-light blanket net catches with midwater trawl catches, 2 daytime and 3 nighttime 45-minute surface tows were made at Blanca Bay, then 7 night-light stations were occupied at various points along the trawl tracks on the succeeding night. Pelagic species caught with the trawl included sardines, Pacific mackerel, jack mackerel, anchovies, and round herring. The night trawls produced better catches than the day trawls in number of species and quantities of fish.

The blanket net caught relatively larger catches of sardines and all pelagic fish investigation project species except anchovies. The trawl caught a great many more other species, especially bottom forms.

Trawling was conducted at various other locations along the cruise track, generally within 10 fathoms of the surface. Catches consisted almost entirely of anchovies and corresponded quite well with night-light station catches in the same vicinity. A notable exception was at San Carlos Bay, where the heaviest concentrations of anchovies were found. A 20-minute night trawl loaded the net so heavily the cod end burst, but night-light stations located directly over these fish failed to attract them. A surprising trawl catch of 220 adult barracuda was made in this same area during daytime. One deep tow (100 fms.) for hake over the edge of the continental shelf off Sacramento Reef failed to produce deep water species.

Thus far, the trawl appears to sample anchovies more consistantly than the blanket

net used with a night light. It was felt previously that cruises have grossly undersampled that species because they are frequently negatively phototactic.

Excellent weather prevailed during almost the entire cruise. Sea surface temperatures ranged from 66° F. at Pt. Canoas to 57° F. at Pt. Baja.

Airplane Spotting Flight 62-12-Pelagic Fish (November 15-16, 1962): The survey to determine the inshore distribution and abundance of inshore pelagic fish schools from the United States-Mexican Border to Santa Cruz, Calif., was continued by the Department's Cessna "182" 9042T.

On November 15, 1962, the area from Point Sal to Santa Cruz, Calif., was surveyed. Eighteen anchovy schools were sighted off Cayucos and 14 in San Simeon Bay. Four anchovy schools were counted in Monterey Bay: 2 off Santa Cruz and 2 about 2 miles off the Salinas River. Twelve unidentified schools were close to shore about 2 miles north of Monterey. Despite the scarcity of fish schools, birds were quite active and a few porpoises were present in the middle of the bay.

On November 16, 1962, the coastal area from the United States-Mexican Border to Pt. Conception was surveyed. The only fish seen were 10 unidentified schools off Pt. Loma.

There were small amounts of red tide in Monterey and Santa Monica Bays, and also off Long Beach and Oceanside. The brightest red tide was below Point Loma; in October 1962 the highest intensity was around the Long Beach and Port Hueneme areas. In September 1962 it was brightest in Monterey Bay.

Note: See Commercial Fisheries Review, December 1962 p. 22, November 1962 p. 18, October 1962 p. 11, August 1962 p. 15, July 1962 p. 12, May 1962 p. 14.

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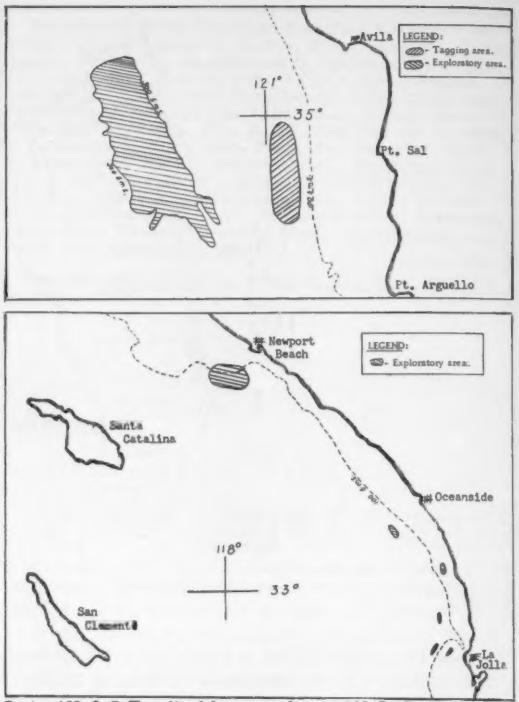
PETRALE SOLE TAGGING AND BOTTOMFISH SURVEY OFF SOUTHERN CALIFORNIA:

M/V "N. B. Scofield" Cruise 62-S-7-Trawl (October 9-November 9, 1962): The offshore waters between La Jolla and Newport Beach, Calif., were surveyed for concentrations of bottomfish, and petrale sole were tagged in deep-water offshore from Pt. Sal by the California Department of Fish and Game research vessel N. B. Scofield.



Cruise (62-S-7-Trawl) of the research vessel N. B. Scofield to tag petrale sole and survey offshore areas for bottomfish.

Between October 11 and November 4, 1962, 350 petrale sole (Eopsetta jordani) were tagged off Pt. Sal in 110 to 190 fathoms, mostly in 170 to 190 fathoms. The fish were tagged with vinyl spaghetti-type tags.

Two days were spent tracking the Pt. Sal area, and one, 1-hour tow was made at 300 fathoms, which yielded approximately 45 pounds of Dover sole (Microstomus pacificus), 50 pounds of sablefish (Anoplopoma fimbria), and small amounts of other species.

Twelve tows were made in Newport Beach area from 70 to 300 fathoms. The most predominant species were English sole (Parophys vetulus), Dover sole, rex sole (Glyptocephalus zachirus), sablefish, and greenspotted rockfish (Sebastodes chlorostictus).

Two tows were made in the Oceanside area: one at 50 and the other at 250 fathoms. Each tow was of 30 minutes duration. No significant poundage of fish was taken in either tow.

In the La Jolla area three tows were made at 50, 200, and 250 fathoms. No significant

catches of any species were made at any of the three stations. The area in 50 fathoms was unsuitable for trawling.

Great numbers of sea urchins (Allocentrotus sp.) were taken in each of the four trawling areas (from 25 to 150 pounds per tow). They were especially abundant off Newport Beach.
Note: See Commercial Fisheries Review, July 1962 p. 13, and March 1962 p. 21.

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PRESEASON SAMPLING OF DUNGENESS CRAB POPULATION OFF CENTRAL CALIFORNIA INDICATES ANOTHER POOR SEASON:

M/V "Nautilus" Cruise 62-N-2j (October 16-November 7, 1962): To sample the preseason population of Dungeness or market crabs (Cancer magister) was the principal objective of this cruise. A secondary objective was to determine size, sex ratios, and condition of crabs from different areas. The cruise was made by the California Department of Fish and Game research vessel Nautilus in the coastal waters off central California from Point Montara to the Russian River.

Dungeness Crab (Cancer magister)

According to the survey, the California biologists believe the catch for the 1962/63 season will be between the 1961 season's catch of 687,000 pounds and the 1960 season's take of 2,300,000 pounds. Adjustment of those figures by percentages indicates total 1962/63 landings will fall between 728,000 and 1,600,000 pounds.

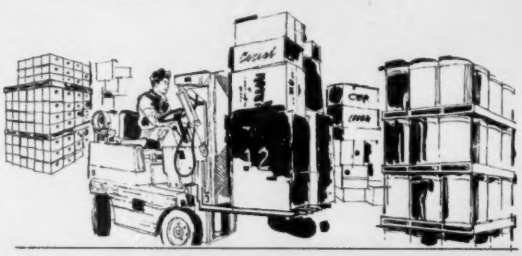
Sampling stations were selected randomly from the crabbing areas between Point Montara and the Russian River. Fifty 40-inch commercial-type crab traps, without escape ports, were fished in 10 to 40 fathoms of water. A string of 10 traps was baited with rockfish carcasses and squid and allowed to fish overnight at 71 stations, except at 6 stations strings were not pulled for 48 hours and one string fished 64 hours because of bad weather and vessel trouble.

In all, 5,508 crabs were taken in the traps, 2,844 legal-size males, 2,545 sublegal-size males, and 119 females. The average legal catch per trap of 4.1, was only slightly higher than the 3.2 legal-size crabs per trap taken in 1961 when San Francisco fishermen had their worst year on record for the area. The sublegal-size catch of 3.52 per trap was down from 1961 so the picture is not bright for the San Francisco crab fishermen.

The catches were scattered over the entire area in waters generally 10 to 30 fathoms deep. The best catch however, was in 34-37 fathoms off Point Reyes and averages 28 legal-size crabs per trap. Other deep-water sets were not as productive.
Note: See Commercial Fisheries Review, October 1962 p. 9.

Cans--Shipments for Fishery Products, January-October 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-October 1962 was 7.5 percent above that used during the same period in 1961. Before 1962, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. It is believed that only a small amount of aluminum is being used in cans used for fishery products at present.



A total of 2,680,088 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first ten months of 1962, whereas in the same period of 1961 (when only tinplate was reported 2,493,931 base boxes of steel were consumed.

The increase was due mainly to larger packs of Maine sardines, shrimp, salmon, and tuna during 1962.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches equivalent to 112 sheets 14"x20" size. The 1962 data are derived by use of the factor 21.8 base boxes per short ton of steel.

Central Pacific Fisheries Investigations

FEEDING BEHAVIOR OF SKIPJACK TUNA STUDIED:

M/V "Charles H. Gilbert" Cruise 62 (November 26-December 18, 1962): The main purpose of this cruise by the Charles H. Gilbert, research vessel of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, was to capture and bring back live tuna for use in the Laboratory's research on the behavior, sensory powers, and learning ability of these commercially-valuable and often elusive fish. The cruise was conducted in the vicinity of the Island of Oahu and did not exceed a 65-mile radius from Honolulu.

The biologists succeeded in bringing back unusually good numbers of several tuna species, all of them extremely sensitive fish which literally die at the slightest touch. By using delicate handling technique developed by the Laboratory and by making many trips back and forth between Kewalo Basin and the fishing grounds, the vessel delivered alive to the shoreside behavior study tanks 13 aku (oceanic skipjack), 61 kawakawa (little tunny), 18 ahi (yellowfin tuna), and 13 frigate mackerel (Auxis thazard). These fish were immediately subjected to intensive tests and observations, because their survival in captivity is unpredictable and has never been of more than a few months' duration at best.

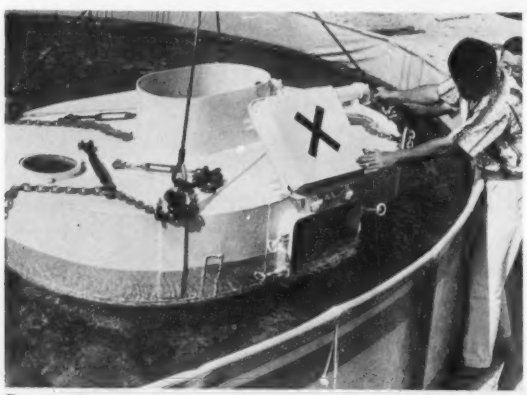


Fig. 1 - Portable skipjack tank in pool of U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu.

While fishing for live tuna specimens was in progress the biologists aboard the vessel took the opportunity to study through underwater observation ports in the vessel's hull

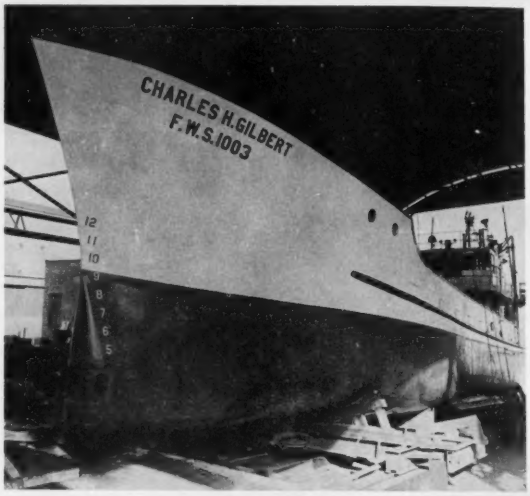


Fig. 2 - Underwater observation chamber in bow of research vessel Charles H. Gilbert.

the feeding behavior of skipjack. The live bait used to bring the tuna in to the fishermen's hooks included both nehu (the common Hawaiian tuna bait fish) and tilapia (used with surface water sprays) from the State's bait-raising plant, so the scientists were able to observe the reactions of the skipjack to two different kinds of prey.

The studies are designed to compare the feeding behavior of skipjack when (1) two different species (nehu and tilapia) are used as bait and (2) surface water sprays are used with tilapia as bait.

The behavior of skipjack as they fed alternately on nehu and tilapia was recorded on movie film on three occasions. The size range of the skipjack was different in each of the experiments: 22-40 cm. (8.7-15.7 inches), 50-62 cm. (19.7-24.4 inches), and 60-71 cm. (23.6-28.0 inches). Skipjack of the smallest size group were accompanied by yellowfin tuna and of frigate mackerel of similar sizes.

Many of the tuna caught on the cruise failed to survive to be placed in the Laboratory's tanks, and from 98 of the skipjack which did not, blood samples were taken for typing. The results will be used in the Laboratory's Pacific-wide investigation of the distribution and relationships of tuna subpopulations and particularly the problem of how many different populations of skipjack contribute to the Hawaiian commercial fishery.

The watch for bird flocks and fish schools resulted in 28 sightings of which 6 were skipjack; 1 mixed skipjack, yellowfin, and frigate mackerel; 2 little tunny; 1 mixed little tunny and frigate mackerel; 1 porpoise; and 17 unidentified.

A writer with the U. S. Naval Photographic Center in Washington, D. C., boarded the ship for one day on November 28 to collect material for a script on oceanographic research in the United States.

The first right gill arches of 56 skipjack, 13 little tunny, and 6 frigate mackerel were collected and frozen for the behavior program.

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SEASONAL AVAILABILITY OF HAWAIIAN SKIPJACK TUNA MAY BE PREDICTED FROM STUDIES OF OCEANOGRAPHIC CLIMATE:

Oceanographic research at the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries has shown that the Hawaiian oceanographic climate is primarily determined by seasonal changes in surface water movement. During spring and summer California Current Extension water spreads northward into the Hawaiian Islands, displacing the higher salinity North Pacific Central water. This process is reversed in later summer and fall when the California Current Extension water retreats southward and higher salinity water returns to the islands. The timing and intensity of these water movements are reflected in the monthly changes of sea surface temperature and salinity which are regularly measured at Koko Head, Oahu.

It has always been suspected that seasonal changes in the trade wind system were the cause of the seasonal surface water movements, however, not until an investigation of the time-sequence temperatures and salinities from Koko Head was made, was it possible to associate changes in the trade wind system with those ocean processes. Recently a preliminary analysis was made of the monthly mean sea level pressure charts in terms of the location of the center of trade wind action and the strength of the trade wind system. This indicated that during the period of northward displacement of the California Current Extension water the center of wind action was located over the California Current Extension. During the period of southward displacement, the center was located over the North Pacific Equatorial system. Onset of northward and southward movement coincided with the change of location of the center of trade wind action.

It also became apparent that the strength of the system, an index combining the geostrophic (defective force due to rotation of the earth) wind speed with the size of the system, is a more important parameter than trade wind speed alone. Maximum strength of the trade wind system occurs during July and August and minimum strength during December and January, which is in phase with maximum and minimum surface water motion as reflected by the Koko Head temperature data. Maximum and minimum wind speeds, on the other hand, do not coincide with the maximum and minimum intensity of surface water movement.

If these relationships found in the average situation hold during a forthcoming investigation of individual years, then important progress will have been made in gaining understanding of the linkage mechanism between wind action and surface water motion in the Hawaiian region. It will also make possible prediction of season skipjack availability in Hawaiian waters directly from weather charts. This prediction is presently based on the time of initial heating at Koko Head.

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RESEARCH VESSEL SCOUTS FOR SKIPJACK TUNA EAST OF HAWAII:

A search for skipjack tuna (aku) in a new area and with new fishing methods was initiated on January 10, 1963, by the U. S. Bureau of Commercial Fisheries Honolulu-based research vessel Charles H. Gilbert. This cruise, to which the name Boundary I has been given, will take the ship to the vicinity of 150° W. long., about 450 miles east of the Hawaiian Islands, in an area which Bureau scientists consider likely to be the winter range of the skipjack tuna schools which

Research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries.

support a productive summer fishery in Hawaiian waters.

The "boundary" for which the cruise is named is the division between two important water types of the central Pacific, the California Current Extension, and the North Pacific Central water. Studies carried out around the Hawaiian Islands during the summer fishing season have indicated that skipjack schools are numerous in the vicinity of this boundary. This cruise is aimed at discovering whether this is also true in winter, when the boundary lies to the east and south of the Islands. The scientists will find the location of the boundary by measuring the salt content of the ocean surface water and will then fish in the boundary and to the north and south of it to discover how it is related to the abundance of skipjack.

Fishing for skipjack tuna, both commercially and for scientific sampling, is generally done with pole-and-line and live-bait, and the research vessel will carry in her bait tanks a supply of the hardy tilapia for the purpose. However, because the area to be surveyed is so far from base and because of the duration of the cruise (almost 2 months), it will not be possible to rely entirely on live-bait fishing. Therefore, the vessel's crew will fish for skipjack with tuna long lines, similar to those used in Hawaiian waters for catching large tuna and marlins, but with hooks and bait more suited to the smaller skipjack. A small-scale long line of the type used for salmon fishing in the northwestern Pacific will also be tried out.

One of the main purposes of sampling skipjack tuna east of Hawaii, in addition to that of gaining information on the relation of the fish to water types, is to collect specimens of blood for typing. Examination of the blood types will reveal whether the skipjack tuna found along the boundary in winter are members of the population which supports the Hawaiian summer fishery or another population.

Many fishery scientists believe that the skipjack tuna offers the greatest production potential of all the tuna species. Although many thousands of tons of this small tuna are taken by the existing fisheries off Hawaii, Japan, and the Central and South American coasts, there is evidence that the yield could be greatly increased if more efficient ways of discovering and capturing the schools could be devised. Recent indications that yellowfin tuna production in the eastern Pacific is nearing its natural limits have heightened the United States fishing industry's interest in the skipjack tuna resource, an interest that is reflected in the present cruise of the Charles H. Gilbert.

Composition of Fishery Products

NEW METHOD FOR DETERMINING PHOSPHORUS IN FISHERY PRODUCTS:

Evaluation of methods of phosphorous determination are under study by the U. S. Bureau of Commercial Fisheries Laboratory at Seattle, Wash., because of the existing need for a more rapid and accurate method for determination of phosphorous in fishery products. The studies and research have resulted in the discovery of a new method.

The new method involves burning a fishery product sample in an oxygen-filled flask containing dilute nitric acid, which absorbs the gases upon boiling. The phosphate is then determined colorimetrically. The total time required for phosphorus determination is now less than one-half hour. This is quite a substantial improvement over the old method which was time consuming (taking many hours), and even less accurate.

Crabs

LOW BLUE CRAB CATCH PREDICTED IN CHESAPEAKE BAY FOR 1962/63 WINTER:

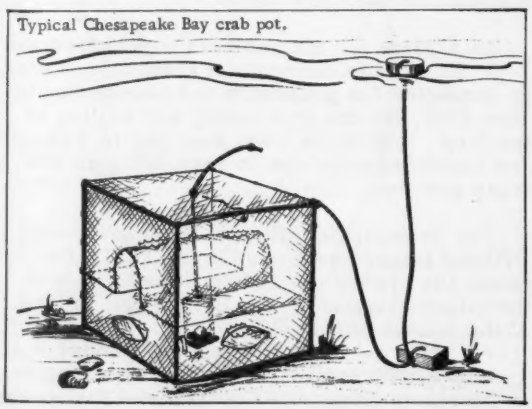
Despite the fact that the first week's crab dredge catch was good early in December 1962, the quantity of blue crabs in the Chesapeake Bay during the 1962/63 winter was still considered to be small. Dredge boat catches until

Blue Crab

the end of March should be much below average, according to biologists of the Virginia Institute of Marine Science, Gloucester Point, Va. An average catch, based on more than 30 years of records, would be about 11 barrels of crabs a day. While catches up to the boat limit of 30 barrels per day have been made by many dredgers since the opening of the dredge season December 1, catches were expected to decline rapidly to 10 or fewer barrels by the end of the month and then further decline in January.

An early indication that the supply would be small came from Tangier, where crab houses reported low catches of soft and peeler crabs this summer. Further indications came in the fall of 1962 with reports of low catches of hard crabs by crab pots throughout the lower Bay.

Typical Chesapeake Bay crab pot.



The picture appeared similar to that of the winter of 1959/60, when scientists also predicted below-average catches. December 1959 opened with large catches too, but catches dropped to about 10 barrels the middle of the month and then continued a slow decline over the next two months. Although the supply was supplemented with truck shipments from the Carolinas, some of the crab houses were operating only about three days a week.

"Relief from the short supply in the Bay may not be in sight in 1963," a marine scientist at the Virginia Institute of Marine Science reported. "The 1962 hatch of crabs appears to have been light, and our tenative prediction is that the stocks will remain low through 1963 and until August 1964. We have seen signs of a very late fall hatch, but the crabs were too small to be caught in our experimental trawl net surveys and we have been unable to estimate their number. Nothing further can be learned about the size of the crop until field surveys begin again in May 1963."

Delaware River Basin

COOPERATIVE FEDERAL-STATE STUDY YIELDS DATA ON FISHERIES RESOURCES:

A study of fisheries conditions in the Delaware River had been conducted cooperatively over the past four years by the U. S. Fish and Wildlife Service and the States of New Jersey, New York, and Pennsylvania. The study has produced a mass of valuable data which needs to be analyzed and evaluated in order to be useful for the protection and improvement of the fisheries resources of the Delaware River Basin. The Delaware River Basin Commission in a formal resolution urged that Federal funds be made available to the U. S. Fish and Wildlife Service for this purpose. (Delaware Basin Bulletin, November 1962.)

Frozen Fish

PATENT GRANTED FOR CHEMICAL SOLUTION THAT REDUCES DRIP:

A new treatment designed to reduce the thawing and cooking drip of frozen fish involves dipping the fish in certain chemical

solutions before the fish are frozen. The inventor of the new treatment claims that his method produces no undesirable side effects. He also claims that frozen fish treated according to his invention have a reduced tendency to turn yellow and are less susceptible to the development of rancidity. (Patent Number 3,036,923, granted May 29, 1962, to John H. Mahon, Scott Township, Allegheny County, Pa., assignor to Hagan Chemicals & Controls, Inc., Pittsburgh, Pa.)

In describing the important agents in the new chemical solutions covered by the patent, the inventor states, "The exact mechanism by which my invention produces its remarkable results is not known. I have found that the sodium and potassium molecularly dehydrated phosphates having a molar ratio of alkali metal oxide to P_2O_5 of about 1 to 1 to about 2 to 1 will significantly reduce thawing drip. . . .when I refer to the 'molecularly dehydrated phosphates,' I mean to include both crystal-line and glassy forms within the specified range of ratios of alkali metal oxide to P_2O_5.

The inventor tested certain solutions covered under the new patent on fresh fish fillets. The fillets were air-expressed from Boston, Mass., to Pittsburgh, Pa., under continual refrigeration. After dipping in the test solutions which were held at 40° F., the fish fillets were allowed to drain, thoroughly, weighed, sealed in polyethylene bags, and frozen at 0° F. The frozen fillets were then held from 7 to 85 days before thawing. The test solutions were evaluated by measuring thawing drip, phosphate pickup, dip uptake, and pH of the fillets. One of the most effective additives in the test solutions was sodium tripolyphosphate ($Na_5P_3O_{10}$) in a concentration of about 12.5 percent. When used in a 4-percent brine solution, that additive reduced thawing drip from fillets held frozen for 34 days to 0.3 percent; used alone the same additive reduced thawing drip from fillets held frozen for 35 days to 1.8 percent. ("Thawing drip" is the weight of fluid lost on thawing calculated as a percentage of the weight immediately before freezing; that is the weight after being dipped and drained.)

The results from various test solutions are described in detail in the patent. A copy of Patent No. 3,036,923 can be obtained for 25 cents from the Commissioner of Patents, Patent Office, U. S. Department of Commerce, Washington 25, D. C.

Editor's Note: It has been reported that a fishery firm in Gloucester, Mass., is using the patented process described above and that the Gloucester firm has obtained a trademark for the process. It has also been reported that the Federation of Icelandic Cooperative Societies got a license on November 8, 1962, to use the process and that it will be used on about 16 percent of Iceland's frozen fish.

Fur Seals

ALASKA SKINS APPRAISED PRIOR TO LETTING PROCESSING CONTRACT:

In December last year, 101 luxury seal furs were appraised by five experts of the fur trade to mark another step in the U. S. Department of the Interior's program to select a contractor to process Alaska's Pribilof Islands fur seal harvest. The industry experts who participated in the recent appraisal were from Chicago and New York City.

The 101 first were submitted by 4 of the 5 firms which have expressed an interest in securing a Government contract for processing the Pribilof Islands fur seal skins. The old contract with the Fouke Fur Company of Greenville, S. C., was terminated on December 31, 1962.

The next step in the selection of a contractor was to submit the luxury furs to the U. S. Bureau of Standards for physical and chemical tests. The ability of the firm to fulfill the contract also was to be considered before any award was made. Selection of the contractor or contractors was expected to be made after February 1963.

As a basis for the contract negotiation, the U. S. Bureau of Commercial Fisheries issued an invitation for proposals and prospectus in June 1962, for the processing and selling of the furs. Raw skins were supplied to 11 firms and individuals for use in developing an adequate process.

The Federal Government has managed the Pribilof Islands seal herd since 1911. Between 1867 (when the United States obtained the Islands located in the Bering Sea as part of the Alaska purchase) and 1911, harvesting of seal skins was done by contract. Today it is done by Alaska natives under the supervision of Interior's Bureau of Commercial Fisheries.

In 1911 the United States, Canada, Japan, and Russia entered into a treaty on the management of fur seals. This was the first step by the United States in international conservation. Under the treaty all killing of seals out at sea was stopped. This made it possible to begin conservation of the Pribilof fur seal herd. The task was assigned to the Bureau.

In 1962 about 78,000 of the fur seal pelts were harvested. Furs sold in 1962 were valued at more than $4 million.

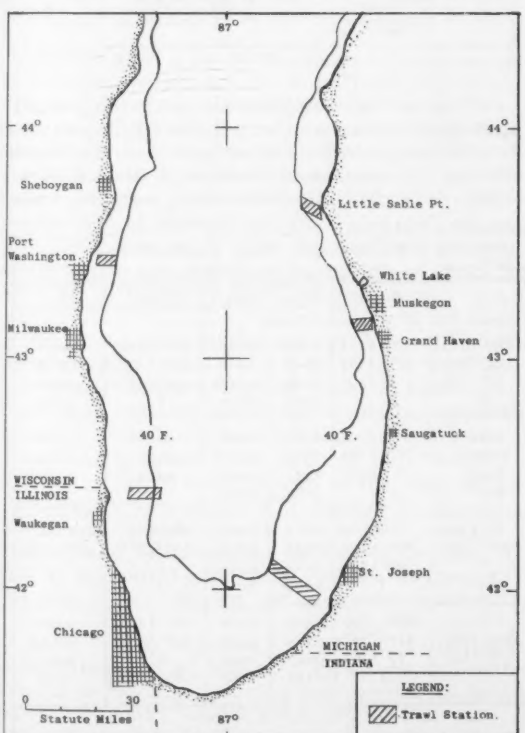
Note: See Commercial Fisheries Review, December 1962 p. 33, August 1962 p. 92, and January 1962 p. 65.

Great Lakes Fisheries

Exploration and Gear Research

TRAWL FISHING EXPLORATIONS OF SOUTHERN LAKE MICHIGAN COMPLETED FOR 1962:

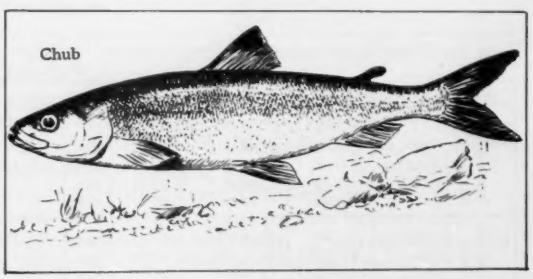
M/V "Kaho" Cruise 6 (November 13-21 and December 11-20, 1962): Trawl explorations along the east and west shores of southern Lake Michigan were completed for 1962 with fishing operations at preselected locations. Conducted by the exploratory fishing vessel Kaho of the U. S. Bureau of Commercial Fisheries, the objectives of the study were to obtain additional seasonal information concerning the depth and geographic distribution of various fish stocks and their availability to commercial-type bottom trawls.



Lake Michigan explorations M/V Kaho Cruise 6 (November 13-21 - December 11-20, 1962).

A total of 48 drags was made at three locations (Benton Harbor, Grand Haven, and Little Sable Point) on the eastern side, and two locations (Waukegan and Port Washington) on the western side of the Lake. All drags were of 30 minutes except one that was terminated when commercial gill-net sets were encountered. Bottom obstructions were met during 4 drags and severe net damage resulted during 3 of them. Standard 50-foot (headrope) Gulf of Mexico-type semiballoon trawls were used.

Fishing results were generally good on both sides of the Lake with the exception of the Port Washington station which was fished in December only (see tables 1 and 2). Best catches from the other stations ranged from 345 to as much as 1,850 pounds per drag in November, and from 905 to 1,150 pounds per drag in December. Most productive depths were 20 to 35 fathoms in November and 25 to 40 fathoms in December.



Alewife and "bloater" chubs dominated all significant catches except those taken during three drags at 15, 20, and 25 fathoms off Waukegan in November. These drags yielded 625, 180, and 270 pounds, respectively, of mostly commercial size yellow perch. Large chubs made up to seven percent of each catch of that species. Except for smelt which were taken in quantities up to 50 pounds per drag, all other species collectively amounted to less than five percent of each significant catch.

Although severe weather conditions prevailed over Lake Michigan during November and December, fishing conditions were good at least 50 percent of the time during each of the cruise periods. The start of the December phase was delayed 3 days due to a record-setting blizzard, and 2 days were lost due to equipment breakdown. Surface water temperatures ranged from 49° to 53° F. in November and from 34° to 43° F. in December.

Table 1 - Trawl Explorations, Lake Michigan (East Side) by M/V Kaho Cruise 6
(Phase I--November 14, 18, 19; Phase II--December 14, 1962)

Nearest Five-Fathom Depth Increment	Areas Fished on Eastern Side of Lake Michigan			
	Benton Harbor	Grand Haven		Little Sable Point
	Phase I	Phase I	Phase II	Phase I
	(Catch Rate--Pounds Per 30-Minute Drag)			
10	T[1]	(74-A) 303 (23-B) (3-0)	0	(94-A) 66 (3-B) (3-0)
15	(96-A)[2] 75 (2-B) (2-0)	(73-A) 319 (22-B) (5-0)	(94-A) 48 (2-B) (4-0)	(64-A) 104 (8-B) (28-0)[7]
20	(87-A) 345 (3-B) (10-0)[3]	(80-A) 250 (17-B) (3-0)	(94-A) 38 (1-B) (5-0)	(36-A) 760 (54-B) (10-0)[3]
25	(82-A) 325 (15-B) (3-0)	(69-A) 436 (27-B) (4-0)	(87-A) 1150 (13-B) (-----)	(36-A) 480 (61-B) (3-0)
30	(73-A)[4] 44 (20-B) (7-0)	(57-A)[5] 210 (39-B) (4-0)	(71-A) 700 (29-B) (-----)	(59-A) 620 (39-B) (3-0)
35	(67-A) 260 (31-B) (3-0)	(25-A) 474 (70-B) (5-0)	(83-A) 600 (17-B) (-----)	(12-A)[6] 410 (85-B) (3-0)
40	(32-A) 310 (75-B) (3-0)	(33-A) 365 (66-B) (1-0)	-----	(12-A) 370 (85-B) (3-0)
45	-----	-----	-----	(10-A)[4] 52 (83-B) (7-0)

1/T = Trace (less than 5 pounds).
2/Percentage breakdown of catch by species:
Legend:
A = alewife
B = bloater chub
C = other species
3/Mostly salable size yellow perch.
4/Gear malfunctioned.
5/10-minute drag.
6/Net badly torn.
7/Mostly whitefish.
8/Mostly large "smoker-size" chubs.

Table 2 - Trawl Explorations, Lake Michigan (West Side) by M/V Kaho Cruise 6
(Phase I--November 15, Phase II--December 15, 16, 19)

Nearest Five-Fathom Depth Increment	Areas Fished on Western Side of Lake Michigan		
	Waukegan		Port Washington
	Phase I	Phase II	Phase II
	(Catch Rate--Pounds Per 35-Minute Drag)		
10	----	----	----
15	(10-A)[1] 790 (5-B) (85-0)[2]	(---A) 15 (30-B) (70-0)[4]	----
20	(35-A) 680 (23-B) (42-0)[2]	(---A) 69 (43-B) (57-0)[4]	(---A) 10 (37-B) (63-0)[4]
25	(28-A) 725 (31-B) (41-0)[2]	(10-A) 520 (77-B) (13-0)[4]	T[5]
30	(69-A)[3] 290 (22-B) (9-0)[2]	(2-A) 500 (96-B) (2-0)	(---A) 185 (97-B) (3-0)
35	(54-A) 1850 (43-B) (3-0)	(---A) 405 (99-B) (1-0)	(---A)[3] 41 (98-B) (2-0)
40	(17-A) 1100 (80-B) (3-0)	(33-A) 905 (66-B) (1-0)	(---A) 123 (98-B) (2-0)
45	(50-A) 270 (46-B) (2-0)	(44-A) 455 (55-B) (1-0)	----

1/Percentage breakdown of catch by species:
Legend:
A = alewife
B = bloater chub
C = other species
2/Mostly salable size yellow perch.
3/Net badly torn.
4/Mostly smelt.
5/T = Trace (less than 5 pounds).

This cruise completed a year-long trawl investigation in southern Lake Michigan which furnished periodic evaluation of certain areas during the months of February, March, April, June, July, August, November, and December

Table 3 - Summary of Best Catches, by Major Species, 1962 Lake Michigan Trawl Explorations, Michigan Side of Lake

Area:		Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		(Catch Rate--Pounds Per 30-Minute Drag)										
Benton Harbor	Alewife	xxxx[1]	xxxx	T[2]	xxx	T	200 (15)	200 (15)	xxxx	xxxx	300 (20)	xxxx
	Bloats	xxxx	xxxx	170 (40)[3]	xxx	185 (25)	175 (25)	175 (15)	xxxx	xxxx	235 (40)	xxxx
	Perch	xxxx	xxxx	5 (10)	xxx	--	70 (10)	6 (10)	xxxx	xxxx	16 (20)	xxxx
	Smelt	xxxx	xxxx	T	xxx	--	T	7	xxxx	xxxx	T	xxxx
Saugatuck Holland	Alewife	--	10 (40)	T	xxx	80 (10)	xxxx	5 (10)	xxxx	xxxx	xxxx	xxxx
	Bloats	87 (35)	110 (35)	135 (25)	xxx	160 (15)	xxxx	260 (15)	xxxx	xxxx	xxxx	xxxx
	Perch	150 (20)	12 (25)	T	xxx	T	xxxx	135 (10)	xxxx	xxxx	xxxx	xxxx
	Smelt	T	T	T	xxx	T	xxxx	---	xxxx	xxxx	xxxx	xxxx
Grand Haven	Alewife	xxxx	xxxx	10 (40)	xxx	25 (10)	10 (15)	T	xxxx	xxxx	360 (30)	1000 (25)
	Bloats	xxxx	xxxx	184 (30)	xxx	110 (35)	300 (15)	505 (15)	xxxx	xxxx	330 (35)	200 (30)
	Perch	xxxx	xxxx	T	xxx	T	T	40 (10)	xxxx	xxxx	T	--
	Smelt	xxxx	xxxx	T	xxx	--	--	T	xxxx	xxxx	T	T
Little Sable Point	Alewife	xxxx	xxxx	10 (35)	xxx	80 (10)	--	520 (10)	xxxx	xxxx	365 (30)	xxxx
	Bloats	xxxx	xxxx	210 (30)	xxx	105 (20)	340 (10)	510 (15)	xxxx	xxxx	400 (20)	xxxx
	Perch	xxxx	xxxx	T	xxx	T	5 (10)	15 (10)	xxxx	xxxx	T	xxxx
	Smelt	xxxx	xxxx	T	xxx	T	T	T	xxxx	xxxx	30 (20)	xxxx

1/xxxx = No fishing effort.
2/T = Trace (less than 5 pounds).
3/Figures in parentheses indicate nearest 5-fathom depth increment from which catches were taken.

Table 4 - Summary of Best Catches, by Major Species, 1962 Lake Michigan Trawl Explorations, Wisconsin-Illinois Side of Lake

Area:		Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		(Catch Rate--Pounds Per 30-Minute Drag)										
Waukegan	Alewife	xxxx[1]	xxxx	xxxx	xxx	130 (20)[2]	400 (15)	T[3]	xxx	xxx	1000 (35)	300 (40)
	Bloats	xxxx	xxxx	xxxx	xxx	400 (25)	580 (20)	285 (25)	xxx	xxx	880 (40)	600 (40)
	Perch	xxxx	xxxx	xxxx	xxx	5 (15)	145 (15)	--	xxx	xxx	625 (15)	T
	Smelt	xxxx	xxxx	xxxx	xxx	T	50 (15)	T	xxx	xxx	60 (20)	45 (25)
Milwaukee	Alewife	xxxx	xxxx	xxxx	xxx	65 (15)	30 (15)	--	xxx	xxx	xxxx	xxxx
	Bloats	xxxx	xxxx	xxxx	xxx	340 (25)	195 (35)	500 (35)	xxx	xxx	xxxx	xxxx
	Perch	xxxx	xxxx	xxxx	xxx	T	T	--	xxx	xxx	xxxx	xxxx
	Smelt	xxxx	xxxx	xxxx	xxx	--	15 (20)	--	xxx	xxx	xxxx	xxxx
Port Washington	Alewife	xxxx	xxxx	13 (25)	xxx	15 (20)	T	T	xxx	xxx	xxxx	T
	Bloats	xxxx	xxxx	435 (30)	xxx	285 (20)	320 (20)	1000 (20)	xxx	xxx	xxxx	180 (30)
	Perch	xxxx	xxxx	T	xxx	--	--	--	xxx	xxx	xxxx	--
	Smelt	xxxx	xxxx	450 (20)	xxx	T	T	T	xxx	xxx	xxxx	6 (20)
Two Rivers	Alewife	xxxx	xxxx	T	xxx	20 (25)	xxxx	60 (20)	xxx	xxx	xxxx	xxxx
	Bloats	xxxx	xxxx	365 (40)	xxx	85 (40)	xxxx	320 (20)	xxx	xxx	xxxx	xxxx
	Perch	xxxx	xxxx	--	xxx	T	xxxx	--	xxx	xxx	xxxx	xxxx
	Smelt	xxxx	xxxx	350 (30)	xxx	T	xxxx	5 (20)	xxx	xxx	xxxx	xxxx

1/xxxx = No fishing effort.
2/Figures in parentheses indicate nearest 5-fathom depth increment from which catches were taken.
3/T = Trace (less than 5 pounds).

(see tables 3 and 4). Severe winter weather conditions curtailed operations through March.

On the east side of the Lake catches were of marginal commercial significance in April and June; catches on the west side, however, were good at some stations during that period. From July through December, all stations fished yielded catches which indicate a definite potential for profitable trawl production of alewife and/or "bloater" chubs. This held true each time the stations were visited with the possible exception of the Port Washington station in December.

Heaviest concentrations of "bloater" chubs were usually found in deeper waters than the heaviest concentrations of alewife, although there was considerable intermingling of these species. Best catches of both species were consistently taken from greater depths on the west side in comparison to the east side. The deeper waters (20-40 fathoms) were generally most productive in late winter, early spring, and fall months; shallower depths (10-25 fathoms) generally yielded the better catches in late spring and summer months.

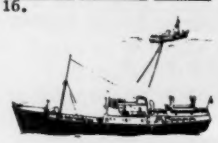
M/V "Kaho" Cruise 8: Kaho will continue exploratory trawl fishing operations in southern Lake Michigan during the months of January, February, and March 1963. The vessel will operate in the southern portion of the Lake in a transect extending from Sauga-tuck, Mich., on the east shore, to Racine, Wis., on the west shore.

The primary objective of the cruise will be to extend seasonal knowledge concerning the depth distribution and abundance of various fish stocks and their availability to bottom trawls. The results will provide information for Lake conditions and depths not studied in previous explorations.

Echo-sounding equipment will be used to survey bottom features and record fish concentrations. A 50-foot (headrope) Gulf of Mexico-type otter trawl will be towed at depths ranging from 5 to 90 fathoms to assess the commercial fishing potential. A 65-foot (headrope) western-style bottom trawl will be used in commercial production efforts where conditions warrant. Hydrographic and meteorological data will be collected at all fishing localities.

The M/V Kaho (Cruise 7) was scheduled to participate in a cooperative investigation with the U. S. Public Health Service during January 1963.

Note: See Commercial Fisheries Review, October 1962 p. 15, June 1962 p. 16.



Great Lakes Fishery Investigations

SPAWNING OF WHITEFISH IN APOSTLE ISLANDS AREA OF LAKE SUPERIOR SURVEYED:

M/V "Siscowet" Cruise 9 (November 13-28, 1962): The annual assessment of spawning whitefish in the Apostle Islands area of western Lake Superior was made during cruise 9 of the U. S. Bureau of Commercial Fisheries research vessel Siscowet.

Large-mesh gill nets ($4\frac{1}{2}$- to $5\frac{1}{2}$-inch mesh) fished at depths of 3 to 6 fathoms on spawning grounds off Cat Island yielded 184 spawning whitefish (152 males, 32 females). The fish ranged in length from 16.1-23.8 inches; 169 were tagged and released. One whitefish which had been tagged on the same spawning grounds in 1961 was recovered. This is our first indication that whitefish may have a homing instinct. Water temperatures on the whitefish spawning grounds ranged from 40.3°-42.8° F.

Small-mesh gill nets ($1\frac{1}{2}$- and $2\frac{1}{2}$-inch mesh) fished with the large-mesh nets on whitefish spawning grounds caught longnose suckers, round whitefish, and lake herring. Stomachs were examined from fish of each species, but only the round whitefish contained fish eggs. Since round whitefish, lake herring, and lake whitefish were all in spawning condition, the fish eggs were not positively identified.

Nearly $1\frac{1}{2}$ quarts of fertilized eggs were collected from round whitefish for studies of embryonic and larval development. Attempts to collect eggs from pygmy whitefish were unsuccessful; only a few were caught, all of which were females.

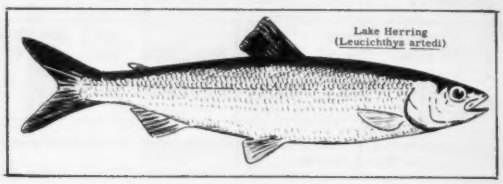
Studies were continued on the abundance and distribution of juvenile lake trout in the Apostle Islands area. Trawl tows yielded 394 lake trout, of which only one was not fin clipped. Nearly all of the fish were returned to the water after removal of the anal fin. Lake trout which had been planted from shore in the Bayfield area in 1962 were most common in the catches; fish from the 1961 and 1960 Bayfield plants were also well represented.

Note: See Commercial Fisheries Review, February 1962 p. 24.

* * * * *

SPAWNING HABITS OF LAKE HERRING AND CHUBS SURVEYED IN APOSTLE ISLANDS AREA:

M/V "Siscowet" Cruise 10 (December 3-13, 1962): Spawning habits of lake herring and chubs were studied in the Apostle Islands region of Lake Superior by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Most lake herring had spawned by December 3, but chubs (Coregonus hoyi, C. zenithicus) had not spawned by December 13. In previous years, lake herring and chubs have spawned at about the same time in that region. Fertilized eggs were collected from lake herring for studies of embryonic and larval development.



Although young-of-the-year alewives were taken in nearly every trawl tow during the fall of 1961, none were taken in 1962. Only 3 alewives (adults) were captured during the entire 1962 season.

Trawl tows at 18-22 fathoms in Pike's Bay yielded 66 juvenile lake trout, of which only 1 was not fin-clipped.

Of 1,873 small (less than 17 inches long) lake trout captured by the Siscowet in the

Fin-Clipped Lake Trout Recaptured in 1962 by M/V Siscowet

Season, Year of Planting, Rearing Station, and Brood Stock	Recaptured During 1962	
	Total Recaptured	Number per 10,000 Fish Planted
Spring 1962:		
Bayfield-Marquette brood.	586	23
Pendills Creek-Marquette brood.	274	23
Fall 1962:		
Pendills Creek-Marquette brood.	70	6
Spring 1961:		
Bayfield-Marquete brood.	315	29
Pendills Creek-Marquette brood.	280	26
Bayfield-Green Lake brood	33	3
Fall 1960:		
Bayfield-Green Lake brood	14	3
Spring 1960:		
Bayfield-Apostle Islands stock.	221	14
Spring 1959:		
Bayfield-Apostle Islands stock.	36	2

Apostle Islands region in 1962, 1,839 (98.2 percent) were fin-clipped. Most of the marked lake trout were returned alive to the water; more than 1,000 were re-marked by removal of the anal fin in an attempt to obtain information on population density, but only 3 of those were recaptured.

The table lists the number of fin-clipped lake trout recaptured from the various plantings and the number of fish caught per 10,000 lake trout planted. The data are based on a total of 184 15-minute trawl tows. Recaptures of less than 10 fish from a single planting are not listed.

Surface water temperature near the end of the cruise was 36.5° F. The cruise was terminated prematurely because of subzero temperatures and high winds.

Note: See Commercial Fisheries Review, January 1963, p. 31, December 1962 p. 37, November 1962 p. 24, October 1962 p. 17, September 1962 p. 26, August 1962 p. 21.

Gulf Exploratory Fishery Program

SEASONAL DISTRIBUTION OF ROYAL-RED SHRIMP AND HARD CLAMS SURVEYED IN GULF OF MEXICO:

M/V "Oregon" Cruise 83 (November 28-December 21, 1962): The objectives of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were to continue seasonal assessment of the royal-red shrimp grounds off the Mississippi Delta and Dry Tortugas, to continue studies on the distribution of fauna of the upper Continental Slope between the 100 and 1,000 fathom contours, and to conduct a seasonal check on the shallow-water hard clam beds off western Florida.

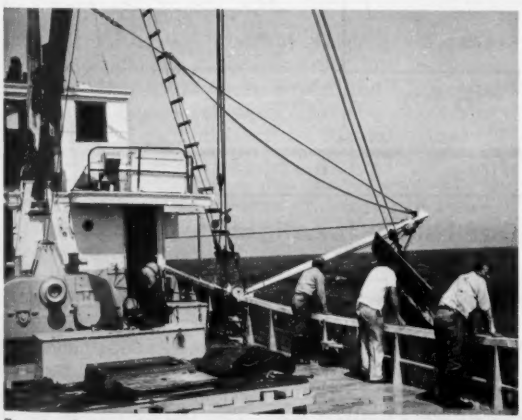


Fig. 1 - Setting the otter trawl on the exploratory fishing vessel Oregon.

Twenty-two trawling stations were completed off the Delta in depths of 100 to 480 fathoms. Concentrations of royal-red shrimp (Hymenopenaeus robustus) were light with best fishing centered between 205 and 225 fathoms. Seven three-hour tows with a 100-foot flat trawl produced only 919 pounds (heads-on) of red shrimp in this depth range. Heads-off count averaged 31-35 shrimp per pound.

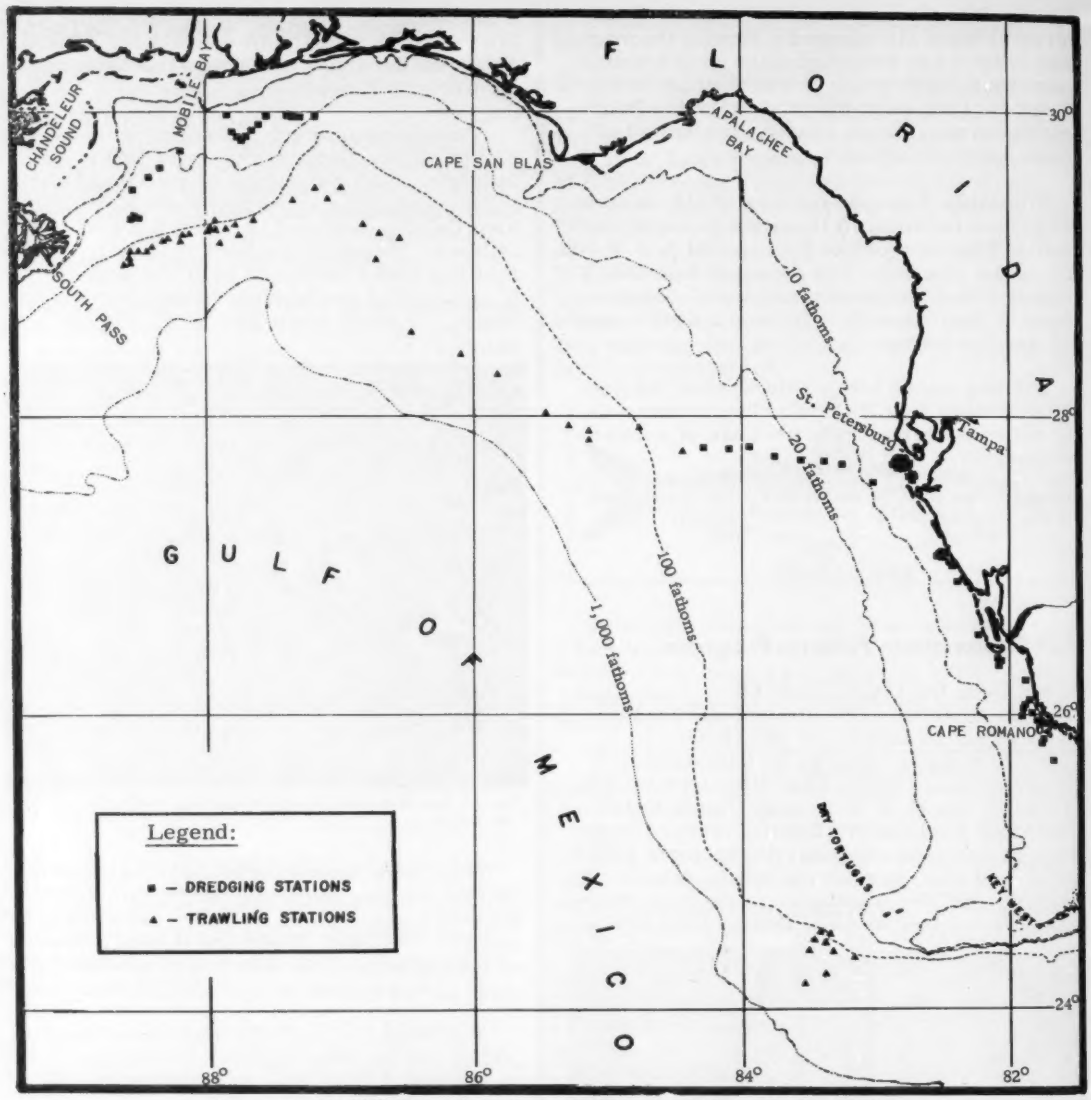
Fig. 2 - Part of a catch of royal-red shrimp on the deck of the M/V Oregon.

Nine tows southwest of Dry Tortugas in depths ranging from 100 to 500 fathoms showed highest concentrations between 190 and 210 fathoms. Eight and one-half hours of towing with a 100-foot trawl produced a total of 410 pounds of red shrimp (heads-on).

Fourteen exploratory tows were made in 200 to 275 fathoms between the offings of Pensacola and Tampa Bay. Red shrimp catches were poor, ranging from 0 to 105 pounds per two-hour tow.

Trawling transects beyond the 500-fathom contour were discontinued due to depth-recorder malfunction.

A total of 44 dredge hauls was made with a 22-tooth Fall River clam dredge along the southwest coast of Florida in depths of 3 to 5 fathoms. Towing time varied from 5 to 45 minutes depending upon bottom conditions. Best fishing was centered off St. Petersburg



Area covered by M/V Oregon during Cruise 83 (November 28-December 21, 1962).

where catches ranged from 20 to 185 hard clams (3-5 inches) per 30-minute tow. Northwest of Gasparilla Island in 4 to 5 fathoms a small area yielded as high as 154 clams in a 15-minute tow. Throughout the entire area worked, heavy beds of pen shells (Atrina rigida) hampered dredging efforts and sampling effectiveness was marginal.

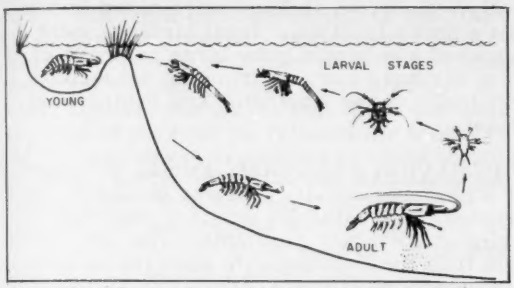
Note: See Commercial Fisheries Review, Jan. 1963 p. 31, November 1962 p. 25, October 1962 p. 19.

Gulf Fishery Investigations

Some of the highlights of studies conducted by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries during October-December 1962:

SHRIMP FISHERY PROGRAM: Shrimp Spawning Populations: The percentages of

ripe and recently-spawned brown shrimp females taken off Galveston during June, July, and August 1962 agreed with comparable observations in 1961. In both years, females in spawning condition were more abundant at 25 than at 15 fathoms.



Life cycle of shrimp. Spawned in the ocean, the larvae (here greatly magnified) migrate to inshore nursery areas. As the shrimp grow, they return to sea where they support the most valuable of our commercial fisheries.

Preliminary examination of brown shrimp ovaries taken January through June 1962 from widely separated 25-fathom stations along the Texas and Louisiana coasts was completed. The results indicate that ovary conditions in the different samples were generally similar.

Six cruises during the quarter closed out sampling operations for 1962. They yielded biological material which included nearly 11,000 specimens of brown, pink, and white shrimp. All penaeid species appeared to be more abundant at the stations west of Galveston. The mean lengths of brown shrimp taken from the 25- and 35-fathom stations declined, suggesting that the smaller shrimp which were present in July and August in $7\frac{1}{2}$ fathoms had moved offshore.

Shrimp Larvae Studies: During the quarter, 180 plankton samples collected between May and July 1962 were examined for penaeid larvae. The results show that the relative abundance of penaeid larvae in statistical areas 14, 16, and 17 remained unchanged from that of the preceding 4 months. However, in all other areas there was an increase in abundance. The increase was most evident in the 0- to 20-fathom zone.

Protozoea, mysids, and postlarvae constituted the bulk of the catch, although a marked increase in the number of nauplii indicated that spawning activity had intensified since the January-April period.

Bait Shrimp Fishery: During the quarter, commercial bait shrimp production in the Galveston Bay area increased by 62 percent over that for the same period in 1961. However, catch per unit of effort for the same period rose by only 9 percent, indicating that demand rather than greater availability of juvenile shrimp was responsible for the increase.

Bait shrimp production in 1962 has surpassed that for any year during the four years the fishery has been given statistical coverage.

Commercial Bait Shrimp Production in Galveston Bay Area, Texas

Year	Catch	Effort	Catch/Effort
	Lbs.	Hrs.	Lbs./Hr.
1962 (Jan.-Nov.)	1,031,500	33,190	31.1
1961	731,200	25,305	28.9
1960	943,400	16,028	58.9
1959	516,800	1/ 9,550	1/ 45.1

1/ For period July-Dec. only.

Migrations, Brown and White Shrimp: As of mid-December, 150 (6 percent) stained and 88 (5 percent) tagged specimens had been recovered from the brown shrimp mark-recapture experiment initiated off Texas in April. Seven were recovered that had been at liberty for more than $6\frac{1}{2}$ months. Preliminary analysis of the data indicates that natural mortality exceeded fishing mortality during the period April-July.

Returns from the brown shrimp projects undertaken in July appear to be complete with 624 (26 percent) and 73 (2.5 percent) recovered from the Grand Isle, La., and Galveston, Tex., experiments, respectively. Over 98 percent of the shrimp recovered from the Louisiana study were taken less than 30 nautical miles from the area of release. The remaining 2 percent had moved less than 60 miles. Almost 90 percent of the shrimp returned from the Galveston experiment were recovered less than 30 nautical miles from the release area. Three of the shrimp from the study traveled more than 130 miles in a southwest direction. In these experiments, the shrimp were marked either with a primary mark and a fluorescent pigment, which can be identified under ultraviolet light, or a primary mark only. No significant difference in the number of returns of the two types of marks was noted.

Two mark-recapture experiments with white shrimp were started during September 1962. A total of 1,905 stained shrimp of a restricted size group was released west of Vermilion Bay, and 2,291 stained shrimp of two different size groups were released

between Cameron, La., and Sabine Pass, Tex. As of mid-December 197 (9 percent) of the marked shrimp had been recovered from the Cameron experiment, and 77 (4 percent) had been returned from the Vermilion Bay experiment. A general westerly movement with little or no movement offshore is indicated by the recapture data.

A short-term mortality experiment conducted in the sea-water laboratory indicated there is no significant difference in the survival rate between shrimp injected with sterile distilled water and those injected with an equivalent amount of fast green FCF as the primary mark, and the fluorescent pigment blaze orange as a secondary mark.

Several groups of shrimp were marked with different fluorescent pigments and primary marks to determine the longevity of the secondary marks, and to determine whether those marks can be differentiated from one another. It appears that 5 of the 6 fluorescent pigments tested can be differentiated, thereby increasing from 2 to 12 the number of proven staining agents which can be identified and used to mark shrimp.

Migrations of Pink Shrimp: Representatives of the 19,860 small pink shrimp stained and released at Indian Key, Fla., in August and September had been recaptured both on the Tortugas fishing grounds to the southwest and on the Sanibel grounds to the northwest. One marked shrimp was recovered in Boca Grande Channel near the northern end of the Sanibel fishing area approximately 73 nautical miles from the Indian Key release site.

Preliminary analysis of returns from the mortality experiment started off Sanibel Island in March 1962 was completed this quarter.

Between December 11 and 15, 2,350 pink shrimp, carefully sorted to uniform size, were stained and randomly released on the Tortugas grounds. Recoveries were coming in at a rapid rate, reflecting a high degree of activity by about 250 vessels fishing in the area. Comprehensive coverage of five landing ports in south Florida will assure a maximum number of recoveries and also furnish daily fishing effort data needed for analysis. An experiment designed to estimate the number of stained shrimp passing through the fishery unnoticed is also being conducted.

Commercial Catch Sampling: During the quarter, "northers" and fog hampered fishing operations along the Texas and Louisiana coasts. Catch per unit of effort, however, remained relatively high for both brown and white shrimp. Pink shrimp, taken only incidently with brown shrimp, were noted in less than a dozen landings. Total landings were bolstered substantially by large numbers of white shrimp emerging from the estuaries, principally in the Galveston and Sabine Pass areas.

BEHAVIOR PROGRAM: During the quarter a new conductivity cell was designed, constructed, and tested for use in measuring experimental salinity gradients. The new equipment fills the Laboratory's need for an instrument which measures conductivity at precise locations within a salinity gradient. Existing commercial conductivity cells are much less satisfactory in this regard due to their large size and relatively closed construction (which tends to prevent rapid equilibration of fluid within the cell with that outside it).

Using this equipment, an experiment was conducted to determine whether the previous salinity history of juvenile shrimp influences behavior in a continuous salinity gradient. Five shrimp held at 25 ‰ (parts per thousand) were introduced into a salinity gradient (4‰-88‰) together with five shrimp held at 90‰ (near the absolute limiting level for this animal). Observations made over a $1\frac{1}{2}$-hour period showed a marked degree of difference between the salinity ranges of the two groups of animals. These results indicate a definite short-term influence of salinity history on the salinity range subsequently selected. These findings suggest that the capacity for salinity conditioning we previously reported for postlarval shrimp is also possessed by the juvenile. They also serve to emphasize that the salinity preference range for young shrimp is not only broad, but flexible. These characteristics would seem to be of great importance to shrimp during the estuarine phase of the life cycle.

Twenty-five experiments were performed to find out if occasional variation in response to temperature gradients could be associated with stages of the molt cycle. No relationship has yet been observed.

A growth experiment, similar to those in which salinity effects have been tested, has demonstrated speciation problems. Postlarvae

obtained on September 27 and held in the laboratory for 2 weeks were subdivided by size into "large" and "small" groups. Examination of 34 "small" specimens, 12 mm. rostrum-telson length or less, indicated that, on the basis of relative distance from rostrum to eye and from third pereiopod to eye, the animals were grooved. Subsequent study indicated, however, that the "small" specimens were, in fact, nongrooved white shrimp. It would appear, therefore, that the above characteristics may not be reliable for identifying the postlarvae of species in these waters. Complete series of postlarvae and early juveniles (from 9 to 35 mm. total length) of grooved and nongrooved shrimp are now available for further study as a result of this and the first salinity experiment.

Present results indicate that brown shrimp contain more carotenoid pigments than white shrimp of equal size. Using a microhomogenizer, tests have been conducted with whole animals as small as 0.3 gram total weight (about 35 mm. total length).

Considerable time was spent during the quarter testing the "CHROMAC"--a device to speed the development of paper chromatograms for possible use in characterizing shrimp species biochemically. Various solvents, including water-saturated phenol, butanol, acetic acid, water, and propanol were tested in separations of standard amino acid solutions, and in extracts of shrimp muscle. It was found that standard paper chromatographic techniques, though slower, gave better and more reproducible chromatograms of the extracts than the CHROMAC.

Studies on rate of brine shrimp hatch were begun. It has been found that hatch is maximal after 18 hours at 30° C. (86° F.) and after 22 hours at 25° C. (77° F.) with hatch rate decreasing rapidly after these times. Oxygenation increases yields at both temperatures--dramatically so at 30° C. A technique for counting brine shrimp nauplii has been developed and tested for precision and accuracy. This information will be used to quantify the food requirements in future work on growth in immature estuarine animals.

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: Analysis of previously collected field data continues. Three areas suitable for comparison in 1961 are (1) Offats Bayou--a small, highly saline body of water with average annual salinity of 18.7‰; (2) Clear Lake-- a small, protected, moderately low saline body with salinity averaging 4.7‰; and (3) Trinity Bay--a large, open bay with salinity averaging 4.0‰, very similar to Clear Lake.

Of the seven most common species caught by trawl in the Galveston Bay system, only one, the spot, was abundant in Offats Bayou. Five of the remaining species, the brown shrimp, white shrimp, croaker, sand sea trout, and blue crab, were much more numerous in Clear Lake than in Trinity Bay even though salinity was similar. Only the bay anchovy was equally abundant in the two low salinity areas. The apparent preference of those species for Clear Lake could very well be a result of sampling bias. Collection stations in Trinity Bay were further from the shore zone than in Clear Lake. Additional study is needed to resolve this problem. With the following reservations, periods of peak abundance for the seven species varied considerably from year to year but for a particular year occurred almost simultaneously in each of the three areas. Peaks were generally reached first in Offats Bayou, then in Clear Lake and Trinity Bay, the latter two areas being farthest removed from the Gulf. Neither the time at which peak abundance occurred nor the corresponding level of abundance seemed to be correlated with salinity. Additional study of the data is indicated.

Species abundance also fluctuated considerably from year to year, with amplitude generally highest for the two species of shrimp and lowest for the blue crab. During the period of study (1958-61), maximum seasonal concentrations of both white and brown shrimp occurred in 1960 followed by a sharp decline in 1961. A similar occurrence was not evident for the other species.

The field (sampling) program is being revised to permit a much more detailed comparison between specific subareas within the Galveston Bay estuarine system as a whole. Generally, the system has been divided so that data can be obtained from the near-shore area of the adjacent Gulf, tidal passes, Lower Galveston Bay, Upper Galveston Bay, the mouth of the San Jacinto River, Trinity Bay, and East Bay. A statistical balance between channel, open-water, and shoreline stations in each subarea and between subareas has been incorporated. In addition, tertiary bays or bayous adjacent to each subarea (except the near-shore Gulf area) are included. Sta-

tions are also to be established in the marsh areas adjoining each subarea.

Both hydrological and biological data will be collected. Arrangements have been made with the Corps of Engineers for an exchange of hydrological measurements. The Corps is presently initiating a large field program in the Galveston Bay system to obtain prototype data for a model study. The data resulting from our mutual efforts should provide the basis for obtaining very good definition of the estuary's hydrological parameters.

Effects of Engineering Projects: Under the present system of coordination with the Branch of River Basin Studies, 24 appraisals were made of engineering and mineral development projects potentially affecting fishery resources in Texas estuaries. The majority resulted from the more than 120 Corps of Engineers public notices received during the quarter. Marine fishery sections of 17 Bureau of Sport Fisheries and Wildlife draft reports on water development projects were received for concurrence of recommendations.

Most of the Corps of Engineers public notices dealt with applications for Department of the Army private permits for mineral development, pipeline construction, channel dredging or bulkheading, and filling. Frequently, these projects require modification to reduce damage to the estuarine habitat and dependent fishery resources. When this is the case, recommendations for corrective action are forwarded to the Branch of River Basin Studies, which in turn, requests the Corps of Engineers to require the applicant to modify the original plans. If oyster leases or reefs are involved, the Corps is requested to have the applicant secure approval of the Texas Game and Fish Commission.

INDUSTRIAL FISHERY PROGRAM: Sea Trouts: The average annual landings of sand sea trout (Cynoscion arenarius) and silver sea trout (C. nothus) from the north central Gulf of Mexico have been estimated at 3,382 tons or 8 percent of the total industrial fishery otter-trawl catches for the years 1959 through 1961.

The relative abundance of the two species of sea trout in inshore waters was determined from samples of trawler catches taken routinely from December 1961 to November 1962. The sand sea trout was approximately four times as abundant east of the Mississippi River Delta, and predominated in the samples each season. Samples from catches made west of the Mississippi River Delta showed that the silver sea trout was about $1\frac{1}{2}$ times as abundant as the other species, and was dominant in the samples from late winter through early fall. The average bottom depth at which fishing occurred varied between 4 and 12 fathoms in both areas.

Sand sea trout were more abundant at all contour depth intervals except the 20- to 29-fathom range. Maximum depth at which sand sea trout were caught with a bottom trawl was 60 fathoms. The maximum depth for silver sea trout was 40 fathoms.

Analysis of length-frequency data from catch samples of the M/V Oregon and the industrial trawler fleet shows that a larger size group (21.0-23.5 cm. or 8.3-9.3 inches) of silver sea trout predominated over bottom depths of 20-29 fathoms while a smaller size group (18.5-20.0 cm. or 7.3-7.9 inches) was dominant over grounds less than 10 fathoms. Data for the sand sea trout reveal a similar distributional pattern in fall with a smaller size group (19.5-22.0 cm. or 7.7-8.7 inches) present inshore (7-10 fm.) and a larger group (26.0-27.0 cm. or 10.2-10.6 inches) offshore (60 fm).

Menhaden: Large-scale menhaden (Brevoortia patronus) are present in Alabama, Mississippi, and Louisiana coastal waters throughout the year, but vary in abundance and size according to season and area. Examination of length-frequency data collected each month (November 1961 through November 1962) from samples of commercial bottom-trawl catches disclosed the presence of three principal size groups between Gulf Shores, Alabama, and Ship Shoal, Louisiana.

A principal modal group (9.0 cm. or 3.5 inches) appearing in winter samples from east of the Mississippi River Delta, progressively increased in size through the following fall (15.0 cm. or 5.9 inches). Large fish (modes 16.0 or 6.3 inches, and 18.5-19.5 cm. or 7.5-7.7 inches), which were present in the samples each month, were relatively more abundant in late fall and early winter. Approximately 48 percent of the fish from east of the Delta samples were between 15.5 and 20.5 cm. (or 6.1-8.1 inches) long.

Three discrete modal-length groups were present in samples from west of the Missis-

sippi River Delta. An intermediate group (15.5-16.5 cm. or 6.1-6.5 inches) was prominent in late winter, increased in size through spring and summer, predominated in late summer samples (mode 15.0 cm. or 5.9 inches) and then disappeared in the fall. Fish representing a larger modal group (17.5-19.5 cm. or 6.9-7.7 inches) were relatively more abundant in spring, early summer, and fall. Length-frequency data show that approximately 80 percent of the fish in samples from west of the Mississippi River Delta were between 15.5 and 20.5 cm. (or 6.1-8.1 inches) long.

CONTRACT RESEARCH: Life History of Late Postlarval and Juvenile Pink Shrimp in Everglades National Park Nursery Grounds: This new project, which began on October 1, 1962, seeks accurate quantitative data on young pink shrimp in an outlet of the nursery grounds. Information on relative abundance, sizes of shrimp, sex ratios of shrimp, and movements of shrimp in this canal in response to environmental conditions will be obtained.

To date, the sampling area has been defined and a special sampling net designed and installed in Buttonwood Canal (at Flamingo, Fla.). Initial trials indicate that with some modification of the cod end, the special net can be used to obtain samples on both ebb and flood tides and can be raised and lowered quickly so as not to interfere with boat traffic. Removal of snags by underwater searching and modification of the canal banks to prevent escapement of shrimp around the ends of the net have been accomplished.

The first night sample, taken on December 10, resulted in 90 pink shrimp being caught in 50 minutes. The small numbers were consistent with results for the same season from previous years. In addition, the size distribution of those shrimp was similar to that of shrimp taken in the same general area with dip nets during Decembers of previous years.

After the net was installed, underwater observations showed that at peak current velocities the lead line rose about 18 inches from the bottom of the canal. Additional weights placed on the bottom line of the net did not remedy the difficulty. It was therefore decided to modify the width of the cod end opening to reduce the drag caused by the net and thereby permit the lead line to remain on the bottom of the canal at all current velocities. if the modified net works as expected, regular sampling will be started the first week of January.

Research Contracts: New contracts were awarded to the Gulf Coast Research Laboratory, Ocean Springs, Miss., to undertake research on the occurrence and abundance of postlarval shrimp in the Mississippi Sound area ($30,000), and to the University of Miami to determine the seasonal distribution and density of postlarval and juvenile pink shrimp in Florida Bay-Everglades area ($42,000).

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PINK SHRIMP STAINED AND RELEASED FOR MORTALITY STUDIES:

M/V "Silver Bay" Cruise 44 (December 4-17, 1962): To capture, stain, and release live pink shrimp (Penaeus duorarum) caught off the Tortugas Islands (off southwest tip of Florida) was the objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

Despite unusually rough seas, close to 2,300 live pink shrimp were stained and released in excellent condition on the Tortugas fishing grounds between December 11-15, 1962.

Note: See Commercial Fisheries Review, December 1962 p. 40, August 1962 p. 26, and June 1962 p. 20.

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SHRIMP DISTRIBUTION STUDIES IN GULF OF MEXICO:

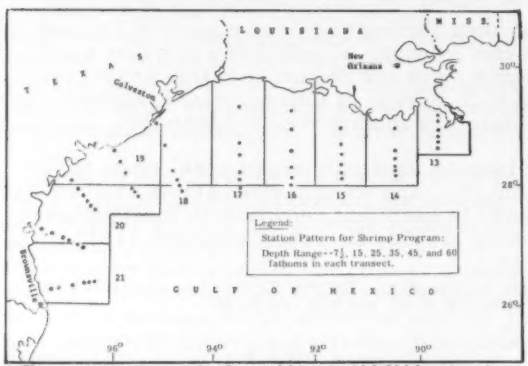
M/V "Miss Angela" Cruise MA-15 (November 29-December 5, 1962): Fair catches of 12-15, 15-20, 21-25 count brown shrimp were caught off the Louisiana coast (except off Cameron) in the 20-40 fathom range by the chartered commercial fishing vessel Miss Angela. The vessel, operated by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries, is engaged in a continuing study of the distribution of shrimp in the Gulf of Mexico. In addition, catches of brown shrimp and some white shrimp (mostly 21-25 and 26-30 count) were made in the 0-20 fathom depth range.

Five statistical areas (13, 14, 15, 16, and 17) were covered in depths ranging from 0-60 fathoms. One three-hour tow in each of the three ranges (20 fathoms, 20-40 fathoms, and 40-60 fathoms) was made.

The best single catch per three-hour tow was 33 pounds of 15-20 count brown shrimp taken in 20-40 fathoms in statistical area 15. The same area yielded 18 pounds of 26-30 count white shrimp in the 0-20 fathoms depth range. Area 14 yielded 25 pounds of 12-15 count brown shrimp in the 20-40 fathoms depth range, and area 16 yielded 24 pounds of 26-30 count white shrimp in the 0-20 fathom depth range.

Catches were very light from all depth ranges in area 17 (off Cameron, La.).

M/V "Miss Angela" Cruise MA-16 (December 14-19, 1962): Shrimp distribution studies were continued off the Louisiana coast in statistical areas 13, 14, 15, 16, and 17 during this cruise by the chartered shrimp fishing vessel Miss Angela. One three-hour tow



Shows station pattern for Cruise MA-16 of M/V Miss Angela (December 14-19, 1962).

was made in depths of 0-20 fathoms, 20-40 fathoms, and 40-60 fathoms in each of the areas. Some good catches of 15-20 count and 21-25 count shrimp were made in the 20-40 fathom depth range.

The catch in the 0-20 fathom depth range in area 13 was 12 pounds of 31-40 count brown shrimp and a few 26-30 count white shrimp. The catch (all brown shrimp) in the 20-40 fathom depth range was only 4 pounds of 31-40 count and in 40-60 fathoms one pound of 15-20 count.

In statistical area 14, the 20-40 fathom depth range yielded 13 pounds of mixed brown shrimp, and one pound of mixed brown shrimp was taken in 40-60 fathoms. Yield from 0-20 fathoms was less than three pounds of brown, white and pink shrimp.

One tow in area 15 in the 20-40 fathom depth range yielded 12 pounds of 21-25 count brown shrimp and another tow in 40-60 fathoms yielded 10 pounds of 15-20 count brown shrimp. A few small brown shrimp and less than one pound of 26-30 count white shrimp were taken in 0-20 fathoms.

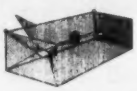
In area 16 no tow was made in the 0-20 fathoms due to fog. The catch of brown shrimp amounted to 16 pounds (15-20 count) in 20-40 fathoms and 11 pounds (12-15 count) in the 40-60 fathoms.

The best catch per tow was made in 20-40 fathoms in area 17--37 pounds of 15-20 count brown shrimp per three-hour tow were caught. The catch from the deeper water (40-60 fathoms) amounted to 6 pounds (12-15 count) of brown shrimp.

The shallow water tow yielded trace amounts of 15-20 count brown shrimp and 2 pounds of 15-20 count pink shrimp.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, Jan. 1963 p. 32, Dec. 1962 p. 42, Nov. 1962 p. 26, Oct. 1962 p. 21, Sept. 1962 p. 29, Aug. 1962 p. 25.



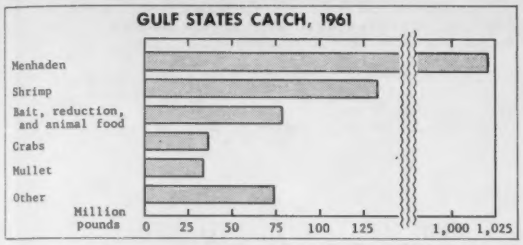
Gulf of Mexico

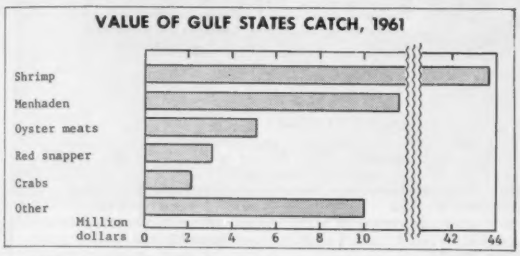
FISHERIES LANDINGS, 1961:

Fish and shellfish landings during 1961 in the Gulf States (West Coast of Florida, Alabama, Mississippi, Louisiana, and Texas) amounted to a record 1.4 billion pounds valued at $75.5 million ex-vessel. This was a

Fig. 1 - Shrimp otter trawlers docked at Aransas Pass, Tex.

gain of 111 million pounds, but a decline of $10 million as compared with 1960.





The increased quantity resulted from record menhaden landings amounting to more than 1 billion pounds--up 180 million pounds over the peak 1960 production. The catch of oysters (18.2 million pounds) and red snapper (11.9) exceeded the 1960 levels by 2.1 and 1.7 million pounds, respectively. Catfish and bullheads, hard blue crabs, and black and red drum were also taken in greater quantities in 1961.

Fig. 2 - Crab boat fishing in Matagorda Bay.

The yield of shrimp (133.8 million pounds) fell 71.9 million pounds below the 1960 level and was the lowest since 1949. The decline in quantity of this high-priced species largely accounted for the marked reduction in value which occurred during 1961.

Three States (Louisiana, Mississippi, and Texas) accounted for 1.2 billion pounds or 90 percent of the volume; while Texas, Louisiana, and the West Coast of Florida accounted for $66 million or 87 percent of the value.

Fig. 3 - Shrimp sorter inside a processing plant in Brownsville, Tex.

There were 22,249 fishermen engaged in the Gulf fishery in 1961. Commercial fishing craft operating in those States during 1961 consisted of 3,270 vessels of 5 net tons and over, 8,571 motor boats, and 640 other boats.

Industrial Fishery Products

OXIDATION OF FISH OILS SLOWED BY ADDITION OF PHOSPHOLIPIDS TO ANTIOXIDANT:

Studies on the phospholipids of tuna and menhaden oils at the University of California, in Berkeley, Calif., are being supported by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Seattle, Wash., to determine their role in the oxidation (rancidity) of the oils in fishery products.

It has been found that phospholipids alone do not inhibit oxidation of those oils. However, when phospholipids are combined with a synthetic antioxidant, there is a very significant increase in the ability of the synthetic antioxidant to prevent oxidation. This significance is indicated by the following example. An antioxidant alone will protect menhaden triglycerides from oxidizing for a period of three days. However, the addition of three-percent phospholipid to the antioxidant will protect the triglycerides from oxidation for periods up to three months. This effect is attributable to presence of a nitrogenous

group in the radical phospholipid molecule.

Fish oils are composed of several different classes of chemical compounds including phospholipids. The amount of phospholipid in whole fish does not vary extensively, in that all fish contain between 0.5 and 0.7 percent phospholipids. Thus, most of the lipid content of a low-oil fish with a low-oil content will be phospholipid while in a fish high in oil a much lower percentage of its total oil will be phospholipid.

The work is under the supervision of the Bureau's Technological Laboratory, Seattle, Wash.

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U.S. FISH MEAL AND SOLUBLES:

Production and Imports, January-November 1962: Based on domestic production and imports, the United States available supply of fish meal for the first 11 months of 1962 was 45,879 short tons (or 9.7 percent) greater than during the same period of 1961. Domestic production was 7,126 tons (or 2.6 percent) greater and imports were 38,753 tons (or 19.9 percent) greater than in the same 11 months of 1961. Peru continued to lead other countries with shipments of 173,099 tons during the first 11 months of 1962--40,778 tons above the imports in the same period of 1961.

The total United States supply of fish meal in calendar year 1961 of 529,100 tons exceeded the peak year 1959 when the quantity amounted to almost 440,000 tons.

The United States supply of fish solubles (including homogenized fish) during January-November 1962 was 14,151 tons more than during the same period in 1961. Domestic production increased 13.5 percent, but imports dropped 5.5 percent.

U. S. Supply of Fish Meal and Solubles, Jan.-Nov. 1961-62 and Total for 1961

Item	Jan.-Nov.		Total
	1/1962	1961	1961
	(Short Tons)		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	243,531	238,144	247,551
Tuna and mackerel	19,411	19,190	21,243
Herring	3,533	5,268	5,268
Other	19,225	15,972	37,203
Total production	285,700	278,574	311,265
Imports:			
Canada	40,550	35,861	38,218
Peru	173,099	132,321	151,439
Chile	8,475	10,738	12,074
Angola	-	1,543	1,543
So. Africa Republic	9,984	12,626	13,026
Other Countries	1,222	1,488	1,545
Total imports	233,330	194,577	217,845
Available fish meal supply	519,030	473,151	529,110
Fish Solubles:			
Domestic production 2/	121,802	107,305	112,241
Imports:			
Canada	1,286	935	1,001
So. Africa Republic	1,717	1,097	1,351
Other Countries	2,918	4,235	4,387
Total imports	5,921	6,267	6,739
Available fish solubles supply	127,723	113,572	118,980

1/Preliminary.
2/50-percent solids. Includes production of homogenized condensed fish.

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U. S. FISH MEAL, OIL, AND SOLUBLES:

Major Indicators for U. S. Supply, December 1962: United States fish meal and fish oil production in 1962 was lower by 0.1 percent and 2.6 percent, respectively, as compared with 1961. Fish solubles production increased 9.9 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, December 1962

Item and Period	1962	1961	1960	1959	1958
	(Short Tons)				
Fish Meal:					
Production 1/:					
December	2,900	12,750	9,185	14,381	14,636
November	11,023	10,058	8,725	10,791	9,749
Jan.-Oct.	274,954	265,497	242,486	250,218	189,230
Jan.-Dec. prelim. totals 2/	288,877	289,039	257,969	275,396	216,510
Jan.-Dec. final tots.	-	311,265	290,137	306,551	248,140
Imports:					
December	-	23,268	15,564	5,508	8,490
November	11,904	25,649	6,149	3,673	6,082
Jan.-Oct.	221,426	168,928	109,848	123,744	85,780
Jan.-Dec.	-	217,845	131,561	132,925	100,352
Fish Solubles:					
Production 3/:					
December	1,600	4,936	2,897	5,429	6,305
November	4,147	5,140	3,524	4,628	8,888
Jan.-Oct.	117,655	102,345	92,508	155,302	114,984
Jan.-Dec. totals	123,402	112,254	98,929	165,359	130,177
Imports:					
December	-	472	60	420	5,180
November	435	3,649	282	3,089	867
Jan.-Oct.	5,486	2,618	2,832	23,121	8,520
Jan.-Dec. totals	-	6,739	3,174	26,630	14,567
	(1,000 Gallons)				
Fish Body Oils:					
Production:					
December	47	1,488	1,038	1,865	1,839
November	1,027	1,360	1,202	1,147	1,028
Jan.-Oct.	31,524	30,522	24,385	21,352	18,555
Jan.-Dec. prelim. totals 4/	32,598	33,471	26,690	24,418	21,625
Jan.-Dec. final tots.	-	34,409	27,853	24,945	21,977
Exports:					
December	-	1,398	2,108	2,611	383
November	23	190	1,952	813	2,037
Jan.-Oct.	16,361	14,743	15,095	15,840	10,119
Jan.-Dec.	-	16,331	19,154	19,264	12,539

1/Does not include crab meat, shrimp, and misc. meals.
2/Preliminary data computed from monthly data. Fish meal production reported currently comprised 86 percent of the annual total for 1958, 90 percent for 1959, 89 percent for 1960, and 92 percent for 1961.
3/Includes homogenized fish.
4/Preliminary data computed from monthly data. Represents over 95 percent of the total production.
Note: Data for 1962 are preliminary.

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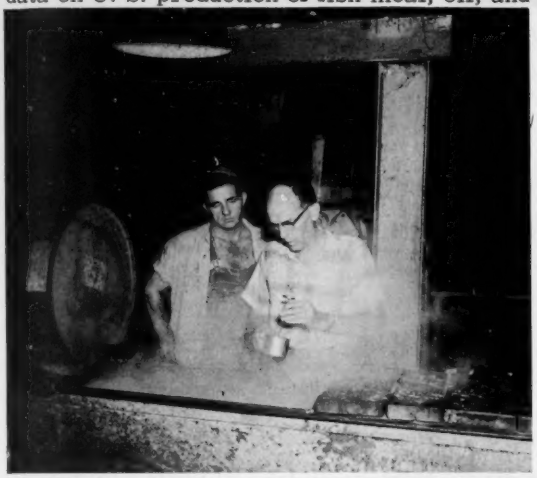
Production, December 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for December 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.



Chemist is determining the temperature of press cake being discharged from the screw press in a Moss Point, Miss., industrial fishery products plant.

U. S. Production [1] of Fish Meal, Oil, and Solubles, December 1962 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles	Homogenized [3]
	Short Tons	1,000 Gallons	Short Tons	Short Tons
December 1962:				
East & Gulf Coasts. .	886	13	199	132
West Coast [2]	1,993	34	1,232	-
Total.	2,879	47	1,431	132

1/ Does not include crab meal, shrimp meal, and liver oils.
2/ Includes Hawaii, American Samoa, and Puerto Rico.
3/ Includes condensed fish.

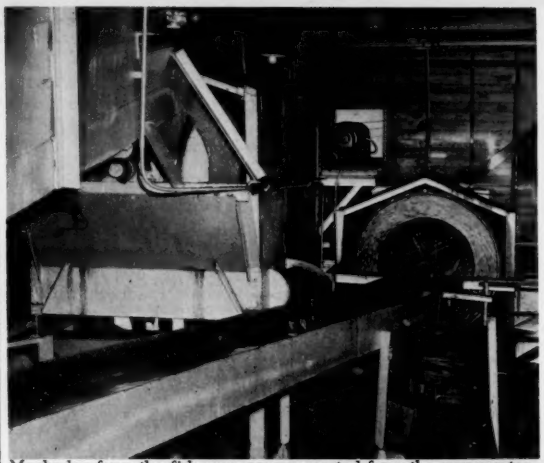
* * * * *

Production, January-November 1962: Preliminary data on U. S. production of fish meal, oil, and solubles for November 1962 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in table 1.

Table 1 - U. S. Production [1] of Fish Meal, Oil, and Solubles, November 1962 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles	Homogenized [3]
	Short Tons	1,000 Gallons	Short Tons	Short Tons
November 1962:				
East & Gulf Coasts	9,307	962	3,019	544
West Coast [2] . . .	2,449	61	1,411	-
Total.	11,756	1,023	4,430	544

1/ Does not include crab meal, shrimp meal, and liver oils.
2/ Includes Hawaii, American Samoa, and Puerto Rico.
3/ Includes condensed fish.



Menhaden from the fish pumps are separated from the pump water in the rotary sieve of an industrial fishery products plant in Moss Point, Miss.

During November 1962, a total of 11,000 tons of fish meal and scrap and 1 million gallons of marine-animal oils were produced in the United States. Compared with November 1961, this was an increase of nearly 1,000 tons or 9 percent in meal and scrap production, but a drop of 341,000 gallons or 25 percent in oil (Table 2).

Menhaden meal amounted to 8,100 tons--accounting for 74 percent of the November 1962 meal total. Oil from menhaden (nearly 1 million gallons) comprised 93 percent of the November 1962 oil production.

There were 4,100 tons of fish solubles produced in November 1962--100 tons below the same month of the previous year. There were 54 tons of homogenized condensed fish produced in November 1962 as compared with 945 tons in the same month in 1961.

During the first 11 months of 1962, domestic meal and scrap production totaled 286,000 tons--7,400 tons above the same period of 1961. The marine-animal oil yield totaled 32.6 million gallons--a drop of 365,000 gallons as compared with the same period in 1961.

Table 2 - U. S. Production of Fish Meal, Oil, and Solubles, November 1962 with Comparisons

Product	November		Jan.-Nov.		Total
	1/ 1962	1961	1/1962	1961	1961
	(Short Tons)				
Fish Meal and Scrap:					
Herring	-	175	3,533	5,268	5,268
Menhaden 2/	8,120	6,799	243,531	238,144	247,551
Sardine, Pacific	13	697	743	1,868	2,518
Tuna and mackerel	2,241	1,999	19,411	19,190	21,243
Unclassified	649	401	18,759	14,104	14,757
Total	11,023	10,071	285,977	278,574	291,337
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	19,928
Grand total meal and scrap	3/	3/	3/	3/	311,265
Fish solubles	4,093	4,195	111,283	95,955	100,551
Homogenized condensed fish	54	945	10,519	11,350	11,690
	(Gallons)				
Oil, body:					
Herring	-	10,000	647,180	817,547	818,017
Menhaden 2/	953,792	1,223,646	30,539,647	30,002,628	31,355,570
Sardine, Pacific	950	20,923	23,589	61,323	86,167
Tuna and mackerel	57,566	89,010	577,179	675,870	762,509
Other (including whale)	14,211	23,998	763,796	1,359,520	1,386,542
Total oil	1,026,519	1,367,577	32,551,391	32,916,888	34,408,805

1/Preliminary data.
2/Includes a small quantity produced from thread herring.
3/Not available on a monthly basis.

Irradiation Preservation

JOINT IRRADIATION STUDIES ON CRAB MEAT AND OTHER FISH PRODUCTS UNDER WAY IN SEATTLE:

Joint irradiation studies on crab meat and other fishery products are being conducted by the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries and the University of Washington under a contract from the U. S. Atomic Energy Commission. The two-phase study program is being conducted in the University's School of Fisheries. The University study group is primarily interested in the bacteriological and biochemical facets of irradiation and the Bureau's Seattle Laboratory group is interested in the commercial feasibility of preservation of fishery products through pasteurization by irradiation.

Both groups make use of Research Irradiator M. K. II, which has 31,000 curies of cobalt from Oak Ridge, Tenn., in 120 small rods nine feet below a shield of de-ionized water.

Crab meat and other fishery products to be irradiated are placed in hermetically-sealed containers and lowered to the bottom of the tank. The length of gamma ray bombardment is carefully timed. Crab meat can be kept fresh after irradiation for up to 28 days and there is no danger from eating any of the irradiated foods. Both of the study groups have eaten irradiated crab meat which was old enough to be thrown out. The concensus of opinion was that "freshness" was preserved and the crab meat was delicious.

Note: See Commercial Fisheries Review, October 1962 p. 25; April 1962 p. 24.

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NEW CONTRACT INCLUDES STUDIES ON THE PRESERVATION OF COD, POLLOCK, AND OCEAN PERCH BY LOW-LEVEL IRRADIATION:

Under a new contract with the Atomic Energy Commission, the U. S Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass., will attempt to find out if cod, pollock, and ocean perch fillets can be successfully irradiated (irradiation pasteurization) and also the maximum acceptable refrigerated shelf life.

Other plans are for new applied and basic investigations into flavor and odor of irradiated seafood. To develop an objective test for quality it is necessary in the more applied aspect of this study to correlate the results of gas chromatography on volatiles from irradiated and nonirradiated fish and sensory evaluations.

The fundamental part of this study will concentrate on methods for collecting and analyzing volatiles present in irradiated and nonirradiated fish. Investigations will also be conducted to determine if new compounds result because of irradiation, and if they do, attempts will be made to define them. The first irradiation, taste tests, and storage experiments on the cod, pollock, and ocean perch fillet series were scheduled for mid-December 1962.

Note: See Commercial Fisheries Review, January 1963 p. 37.

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ATOMIC ENERGY COMMISSION APPROVES EXPANSION OF STUDIES ON FISHERY PRODUCTS:

To determine suitable packaging material for radiation-pasteurized products and the effect of pre-irradiation quality level on post-irradiated storage life are the objectives of expanded radiation preservation studies for fishery products at the Gloucester, Mass., Technological Laboratory of the U. S. Bureau of Commercial Fisheries. Support for the studies has been provided by the U. S. Atomic Energy Commission.

The present program at the Laboratory includes quality studies of irradiated cod, pollock, and ocean perch. The studies are very important in that this entire program will substantially benefit the semicommercial-scale radiation studies that follow.

Funds have also been approved in the current Commission's budget to implement commerical-scale studies in 1965 as construction is completed on a $600,000 marine products irradiator capable of processing 1,000 pounds of fish a day. This irradiator will be located adjacent to the Bureau's Laboratory and will be operated by Bureau employees under a contract with the Commission.

The eventual aim of this research work is to develop the necessary information to stimulate commercial use of radiation pasteurization in extending the shelf life of fresh fish and to demonstrate the economic feasibility of this process to the fishing industry. It is anticipated that eventually housewives in inland cities will be able to purchase irradiated unfrozen marine fish species of high quality.

New England Fisheries

BOTTOMFISH AND SEA SCALLOP FISHERIES YIELD FORECAST FOR 1963:

The abundance of bottomfish (haddock, cod, whiting, ocean perch, and yellowtail flounder) on New England fishing banks will show little change during 1963, but the abundance of sea scallops will decline, the Director of the North and Middle Atlantic Region of the U. S. Bureau of Commercial Fisheries stated on December 27, 1962. This forecast is based on information provided by biologists of the Bureau's Woods Hole Biological Laboratory who monitor the landings of commercial fishermen and study the populations of fish and shellfish on offshore fishing banks by sampling with fishery research vessels.

Fig. 1 - Mending the otter trawl aboard one of larger Boston, Mass., vessels. This method of fishing is important for groundfish (cod, haddock, pollock, and hake) and flounders in all North Atlantic countries.

Haddock landings in New England in 1962 will approximate 115 million pounds, about the same as in 1961. The Georges Bank stocks of haddock which provide the bulk of the New England landings are expected to remain in good supply during the first half of 1963, but small haddock or scrod abundance will drop during the summer. The 1960 age group which

enters the fishery in 1963 as 2-year-old fish appears to be weak and the following age groups, those of 1961 and 1962, are also weak, according to research vessel surveys. Therefore, abundance is expected to decrease after 1963.

Landings of cod in 1962 will be about 34 million pounds, an increase of 3 million pounds over 1961; making 1962 one of the biggest cod years in recent history. The outlook for cod in 1963 is very good. There is an abundance of young fish on the banks which should guarantee good catches in the coming year.

Landings of whiting for food in 1962 will reach at least 70 million pounds, an increase of about 5 million pounds over 1961. No significant change in whiting abundance is anticipated for 1963.

Yellowtail flounder are very abundant on the banks at present. The landings in 1962 were expected to reach 50 million pounds, up about 16 million pounds over 1961 and one of the largest in history. Abundance will continue high in 1963 since the present populations of yellowtail are composed of good numbers of young fish which will increase in weight during the year and contribute heavily to the landings throughout 1963.

Landings of ocean perch or redfish in the United States in 1962 will total about 122 million pounds, the lowest annual catch since 1944. This is about one-half the average landings for the years 1948-51, the peak period in the United States fishery. About 25 percent of the 1962 landings came from the Gulf of Maine, the remainder was mostly from Nova Scotia's banks and the Grand Banks, with practically nothing from the Gulf of St. Lawrence. The recent decline in ocean perch landings is due chiefly to a decrease in fishing effort. The abundance of that fish is holding fairly steady. Thus, landings in 1963 will depend largely on the amount of fishing conducted for that species.

Sea scallops have been unusually abundant during the past few years, but the high abundance is dropping off. United States landings in 1962 will be about 22 million pounds of scallop meats, down about 2 million pounds from 1961. The recent high abundance of sea scallops on Georges Bank was due to a very large age group coming into the fishery in 1959. This age group is now passing out of the fishery and no new age groups of any

Fig. 2 - A scallop fishing vessel docked at New Bedford, Mass.

strength have appeared. Abundance of commercial sizes of sea scallops on Georges Bank is now appreciably lower than it was in 1961. Furthermore, survey cruises by Bureau research vessels failed to turn up any significant number of very young scallops that might enter and support the fishery in the next year or two. Unless new beds are found, there probably will be a definite decline in scallop landings in 1963 and later.

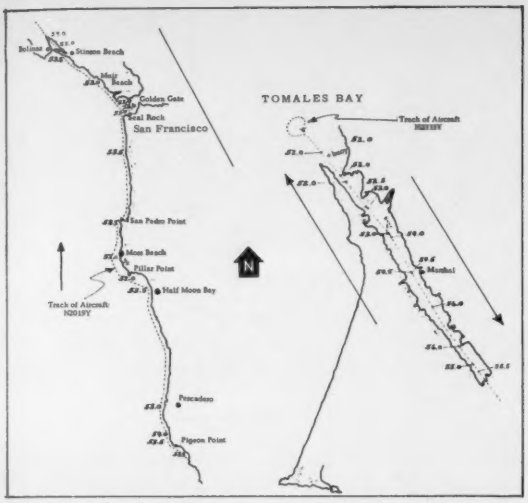
Oceanography

SEA SURFACE TEMPERATURES COLLECTED BY AIRBORNE INFRARED RADIOMETER:

The use of airborne infrared radiometry as a rapid method of obtaining sea surface temperatures was tried by the U. S. Bureau of Sport Fisheries and Wildlife Tiburon Marine Laboratory in California.

In November 1962 an infrared radiometer and supporting electronic equipment (power supply, recording instrument, intervalometer, voltmeter) were installed in a Cessna 172 aircraft. After installation, a series of preliminary tests were made with the airborne unit.

Initial experiments consisted of laboratory observations, calibration of the recording equipment, and flight checks to determine the accuracy of the infrared radiometer. A series of water surface observations was made at several



Aerial infrared sea surface temperatures for Bolinas Bay to Pigeon Point, November 13, 1962.

elevations with the airborne unit and compared with simultaneous observations taken at the water level. Accuracy of $<-0.5^{o}$ F. error was obtained for elevations to 1,500 feet from mean sea level (M. S. L.). Repeatability tests were made over Tomales Bay, where differences of surface temperature were available over a short geographical distance. A flight track from the upper Bay to over the ocean and return indicated repeatability of surface water measurements taken at selected points along the flight track.

During flight operations in the Tomales Bay area, off San Francisco, from Santa Barbara to San Diego, and in the Monterey Bay area, sea surface temperatures were recorded by visual readout and with the aid of a strip chart recorder. Visual readouts were made off selected geographical points, and the chart recorder (30 observations per minute) was operated during portions of the flights. The flight track was a half mile offshore and at elevations of 500 to 1,000 feet.

Of interest is the slightly warmer nearshore water from Santa Barbara to Ventura and from east of Long Beach to Dana Point. The cooling water discharges from the generator plants at Los Alamitos and near Huntington Beach are well defined by increases in surface temperature of up to 10^{o} F.

Immediate plans are to conduct, in cooperation with the California Department of Fish and Game, water surface temperature observations on the Sacramento River System in relation to the spawning of salmon. Also, plans are being formulated to study the effect of temperature changes in the marine environment on the distribution of schooling fish.

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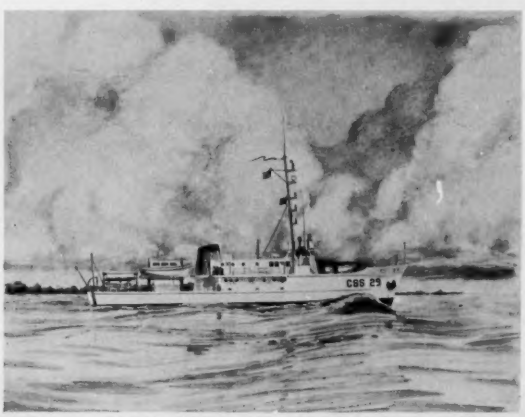
SECOND RESEARCH VESSEL LAUNCHED BY COAST AND GEODETIC SURVEY:

The new U. S. Coast and Geodetic Survey hydrographic and oceanographic research vessel Whiting was launched on November 20, 1962, at a Point Pleasant, W. Va., shipyard.

The Whiting is the second research vessel to be launched recently and is identical to the Peirce, which was launched on October 15, 1962. The two vessels were built under the same contract, totaling $3,733,040.

Known as a Class III, Coastal Survey Vessel, the Whiting measures 163 feet in length and carries a complement of 6 officers and 30 crewmen. She will be deployed primarily along the southeastern seaboard of the United States and in the Gulf of Mexico. The vessel, propelled by twin-screw 800 ship hp. Diesel engines with controllable pitch propellers, has a sustained cruising speed of 12.5 knots and a total displacement weight of 760 tons.

The Whiting has the latest electronic, navigational, and surveying equipment available. This includes Hi-Fix and Shoran navigational Systems, hydrographic winches, and an oceanographic laboratory--a facility which is unique for a vessel of this class. Two auxiliary



Artist's drawing of the Whiting, one of the new Coast and Geodetic Survey vessels.

power craft will be carried on board the Whiting to assist in inshore hydrographic work and supplemental surveys. Like her sistership, the Peirce, this vessel has a reinforced steel hull to cope with ice conditions.

The Whiting commemorates one of the most illustrious men employed in the long history of the Coast and Geodetic Survey who came to work for the Survey in 1838, at the age of 17. For nearly 60 years, until his death in 1897, he remained in the Federal service to become one of the leading scientists of the Nation, and an expert in his profession of topographic surveying. His professional excellence in topography was internationally respected during his lifetime.

The Whiting will replace the Cowie, built in 1927, and now in a poor state of repair. The Whiting will make Norfolk, Va., her home port.

Note: See Commercial Fisheries Review, November 1962 p. 36.

Oregon

REGULATIONS ON SHRIMP AND BOTTOM FISHING FOR 1963:

The decision of the Oregon Fish Commission to ease restrictions on the harvest of bottom fish and leave unchanged the regulations on shrimp fishing was announced on December 13, 1962.

The new regulations on bottom fish increase the tolerance limit on petrale sole landings from 3,000 to 6,000 pounds per trip during the winter period, January 1 - March 31. The number of petrale sole landings per month will continue unrestricted. Gear restrictions were modified to permit a reduction in the minimum wing and body mesh size of trawl nets from $4\frac{1}{2}$ to 4-inch stretched mesh between knots. Minimum size of the mesh in the cod end and intermediate sections remains $4\frac{1}{2}$-inches as at present. Permissible minimum mesh size for the chafing gear that surrounds and protects the cod end was changed from 12 to 9 inches between hog rings.

Shrimp may be commercially harvested in Oregon waters at any time by means of a beam or shrimp trawl. A mesh size of not less than $1\frac{1}{4}$ inches nor more than 2 inches stretched measure between knots may be used.

The action of the Commission followed a public hearing on December 12, 1962.

* * * * *

RECORD NUMBER OF SILVER SALMON EGGS TAKEN BY HATCHERIES IN 1962:

A new all-time high of 39 million silver salmon eggs was taken by Oregon Fish Commission hatcheries in 1962, according to the Commission's Director of Fish Culture. All the salmon eggs were taken from streams on which the hatcheries are located. The ten-year average take of silver salmon eggs prior to 1962 was 10.7 million eggs.

The Director attributed this new record to several factors. First, in 1958, hatchery practices were modified to include pasteurizing all salmon byproducts which are an item in the beginning diet. This practice virtually eliminated kidney disease, one big obstacle to rearing healthy salmon. It was found that the disease was being transmitted to the young fish in the ground-up salmon carcasses being fed prior to that time. (This is a disease which affects fish only, and not humans.)

Another factor was the introduction of the Oregon "pellet," a completely balanced diet which is the product of 12 years of cooperative research with scientists at Oregon State University. Beginning in 1958, this pellet has been fed on a full-scale production basis. Extensive studies also indicated that better returns could be obtained if fish were raised to the "fingerling", or yearling, stage rather than liberated as young fry. This practice was initiated and fish have since been raised to yearling size. After the needs of the hatcheries have been met, any additional eggs are hatched and set out as fry in stream areas without natural runs or, in other situations, areas where additional numbers of fish can be supported such as selected coastal lakes with outlets to the sea. These fish which are set out are raised at no cost to the State.

After hatchery procedures were changed in 1958, the resulting egg take in 1961 from the first returning fish was 32.3 million, the largest in 25 years. In addition, 26,000 jack salmon returned, which frequently is a rough indicator of the magnitude of the following year's run. In 1962, in addition to the 39 million eggs collected for the hatcheries, 55,000 jack returned. This has caused some

problem to hatchery operations, as the bulk of the jacks are males and are not utilized. Studies are now being planned to see if operations can be changed so those fish will return as full-grown adults.

In addition to the egg take, in 1962 enough fish were passed above hatchery racks to account for 4.6 million more eggs, more than enough to seed all available natural spawning area.

In 1959, a total of $6\frac{3}{4}$ million fingerlings was released into coastal and Columbia River tributaries, and the record 39 million eggs were taken from the surviving spawners. In 1960, 8 million fingerlings were released and all factors considered, another big year for silver salmon returns can be expected in 1963.

"All of the Commission hatcheries rearing silvers had higher returns than in the past several years," the Director stated, "and the largest single hatchery egg take was at Bonneville on the Columbia River with over 7 million." Nearly 7 million eggs were taken at Cascade Salmon Hatchery, a new installation starting operations in 1958 just upriver from Bonneville Dam. Two of the coastal hatcheries, Alsea and Klaskanine, topped the 6-million-egg total.

Pollution

MICHIGAN SELECTED AS THE SITE FOR NEW WATER POLLUTION FIELD LABORATORY:

The selection of the University of Michigan at Ann Arbor, Mich., as the location for a water pollution control field laboratory and research facility to serve the Midwest was announced on January 11, 1963, by the U. S. Department of Health, Education, and Welfare.

The laboratory--one of seven regional facilities authorized by Congress in 1961--will be designed and operated by the Department's Public Health Service.

The University is the fifth site to be selected. Previously announced sites for regional laboratories are Ada, Okla., to serve the Southwest; Corvallis, Ore., to serve the Pacific Northwest; Athens, Ga., to serve the Southeast; and College, Alaska. Yet to be selected are locations in the Northeast and Middle Atlantic states.

The University of Michigan Laboratory will serve the 14-State Great Lakes Region which has some of the most pressing water resources and pollution control problems in the country.

Many of the research projects to be carried out by the Laboratory will be cooperative endeavors making use of the resources of various schools and departments of the University of Michigan, such as the School of Public Health, the Medical School, the College of Engineering, the School of Natural Resources, and the Institute of Science and Technology.

The new facility will have about 50,000 square feet of floor space and will cost over $2.5 million. It will have a staff of approximately 150 scientists, researchers and engineers.

Note: See Commercial Fisheries Review, November 1962 p. 41.

Salmon

1963 FRASER RIVER CATCH FORECAST:

A 1963 catch of 2.0 to 2.6 million sockeye and 4 million pink salmon from the fishery for Fraser River salmon in North Pacific Convention waters was predicted by the International Pacific Salmon Fisheries Commission in December 1962. The Commission is responsible for maintaining Fraser River salmon and regulates commercial fishing in Convention waters so as to divide the catch equally between the United States and Canada. The sockeye salmon expected to return to the Fraser River in 1963 belong to the "subdominant" cycle of the Chilko Lake and Adams River systems. The Fraser River produces a run of pink salmon once every two years on the odd years.

Severe restrictions on fishing provided adequate escapement for the drastically reduced 1962 run of sockeye salmon to the Adams River (part of the Fraser River system). Spawners arrived on the Adams River in prime condition and at a good time for effective spawning, so the outlook for a bumper crop in 1966 is promising. The near failure of the 1962 run, which was based on parent stock from the great run of 1958, is considered proof that a correlation exists between the rate of flow of

the Fraser River at the time of the young salmon's seaward migration and the size of the homeward migration of mature sockeye. (Facts on Fish, Fisheries Association of B. C., December 1962.)

* * * * *

PACIFIC COAST STATES FORM INTERAGENCY COUNCIL TO SAVE DWINDLING STOCKS:

An interagency council to save the salmon resources of the Pacific Coast States was organized at the close of the Second Governors' Conference on Pacific Salmon on January 10, 1963.

High level fisheries officials of Washington, Oregon, Idaho, Alaska, and California will join Federal officials, University scientists, and industry leaders on the council to coordinate salmon research and take needed steps to preserve the Pacific salmon resources. The Director of the Oregon State Fisheries Department was named chairman. The Executive Director of the Pacific Marine Fisheries Commission was named secretary of the new council. The first meeting will be held at Portland, Oreg., in March of this year.

A prime responsibility of the new council will be to defend the rights of fisheries in the growing competition for water resources of the Western States. Other problems with which the council will be concerned are hydroelectric and industrial plants that bar the salmon from their spawning grounds.

Salmon on their nest.

A starting point for the new council will be an inventory of about 350 current salmon research projects compiled for the Conference by the Seattle Biological Laboratory of the U. S. Bureau of Commercial Fisheries. Plans call for the Pacific Marine Fisheries Commission to circulate research project plans in advance. The Commission will also distribute results from research projects before formal publication and will coordinate salmon catch statistics from all the West Coast States. A long list of research projects and other needs was submitted to the Conference at its closing session.

This January 1963 Governors' Conference on Salmon held in Seattle, Wash., was the second called in two years by a Pacific Coast State governor in efforts to solve the salmon crisis. The first one met in Juneau, Alaska, in 1960.

Shellfish

NEW YORK CITY PROPOSES REGISTRATION FEES FOR SHIPPERS AND PROCESSORS OF SHELLFISH:

The New York City Board of Health is considering a recommendation to charge annual registration fees of $25 to shippers of shellfish and crab meat and $15 to processors of shellfish for shipment into the City of New York. At present no fees are charged.

The proposed fees are designed to cover some of the inspection, laboratory, and administrative costs involved in servicing this registration.

Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, DECEMBER 1962:

Item and Period	1962	1961	1960	1959
	(1,000 Lbs., Heads-Off)			
Total landings, So. Atl. and Gulf States:				
March	3,317	4,754	4,098	2,950
February	4,125	3,910	3,785	3,227
January	3,828	5,686	5,401	4,310
December	8,500	6,538	7,097	8,716
January-November	96,600	84,858	133,938	121,943
January-December	105,100	91,396	141,035	130,659

(Table continued on following page.)

Item and Period	1962	1961	1960	1959
	....(1,000 Lbs., Heads-Off)			
Quantity canned, Gulf States[1]:				
March	94	38	128	93
February	263	98	223	135
January	536	199	289	308
December	1,979	889	977	1,278
January-November	22,000	14,904	27,617	23,401
January-December	23,979	15,793	28,594	24,679
Frozen inventories (as of end of each mo.)[2]:				
March 31	16,607	31,345	23,232	24,893
February 28	19,012	37,612	29,063	27,555
January 31	21,328	37,842	34,332	30,858
December 31	28,372	19,755	40,913	37,866
November 30	27,500	20,668	37,264	37,334
October 31	21,315	17,811	31,209	33,057
September 30	12,843	13,361	24,492	26,119
August 31	12,754	12,728	20,171	23,780
Imports[3]:				
March	9,658	10,347	8,545	8,492
February	10,599	8,932	7,657	7,481
January	12,907	12,338	8,596	8,238
December	4/	15,442	12,411	10,611
November	17,964	14,852	13,516	10,269
January-October	107,622	95,974	87,491	85,675
January-December	4/	126,268	113,418	106,555
	. (¢/lb., 26-30 Count, Heads-Off)			
Ex-vessel price, all species, Gulf Ports:				
March	80.9	56.0	56.3	67.6
February	78.9	53.5	51.8	69.6
January	76.3	52.5	49.4	70.9
December	5/83-93	75.2	54.2	48.4
November	5/78-93	73.5	54.0	46.2
Aug., Sept., & Oct.	5/88-100	68.3	52.4	45.8
May, June & July	83.1	54.5	58.1	54.0
Wholesale price for froz. domestic brown species (5-lb. pkg.) at Chicago, Ill.:				
March	94-95	69-71	65-68	81-83
February	93-95	69-71	65-67	82-87
January	91-94	69-71	64-66	86-88
December	101-109	91-92	68-70	64-66
November	105-110	89-92	69-73	60-65
Aug., Sept., & Oct.	108-118	76-91	64-73	59-64
May, June, & July	96-104	67-75	72-77	62-76

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 33.
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
4/Not available.
5/Range.
Note: Data for 1962 and 1961 are preliminary. December 1962 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, SEPTEMBER-DECEMBER 1962:

The following is a report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for September-December 1962:

Oyster Studies: The mapping and study of subtidal oyster beds was continued during the quarter. Under the present State law only oyster beds which are intertidal are subject to lease and conservation practices prescribed by law. The importance of the subtidal beds as disclosed by this mapping study indicates that some management program, and perhaps some legal conservation features, should be added to the existing laws.

Fertilized Egg

Young Larvae

Mature larvae just before setting

Oyster spat 5 hours after attachment

The December cold wave which invaded the entire Southeast had little effect on the intertidal oysters. Even though the oysters were exposed during the time of low water to temperatures as low as 10° F. to 12° F., no noticeable kill of oysters resulted. Apparently the insulating ability of the shells was able to protect the oysters during the time of exposure between the tides.

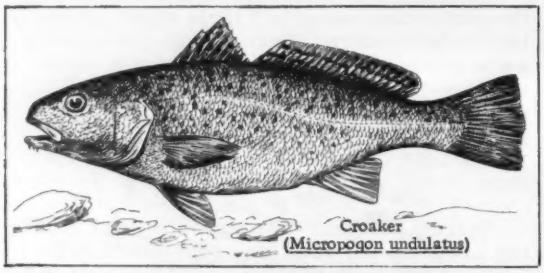
Shrimp Studies: The experimental trawling program for 1962 was completed in December 1962. Data from trawl records for the October-December quarter indicate little change in the abundance of white shrimp as compared with the same period in 1961. The catch per unit of effort for white shrimp during both those quarters was considerably less than the October-December period of 1960, however.

The commercial shrimp catch in South Carolina was several hundred thousand pounds less in October and November 1962 than in that period of 1961, and well below the average catch for those two months in 1959 and 1960. On the whole, however, the shrimp catch in 1962 has been considerably better than in 1961. Through November 1962, approximately 6.3 million pounds of shrimp (heads on) were landed. This is an increase of about $2\frac{1}{2}$ million pounds over the 1961 catch for the same period. The increased commercial catch in 1962 was due largely to the abundance of brown shrimp early in the season.

A cold spell in mid-December brought about a sudden drop in water temperatures throughout the inshore area. During that time water temperatures dropped as low as 41.5° F. No mortality was noted among the shrimp population, although the decreased temperatures apparently did cause a rather sudden migration of the remaining small shrimp in tidal creeks and rivers to the

deeper waters of sounds and offshore. One week after the beginning of the cold spell, shrimp and fish became very scarce in experimental trawl hauls in inside waters, indicating a general migration to the deeper outside waters.

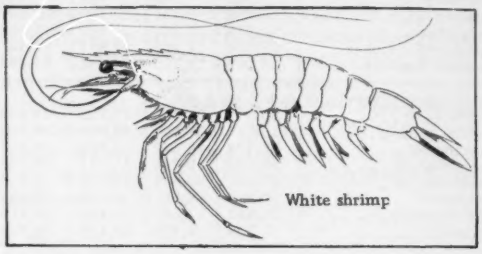
Finfish: Shrimp survey records during the quarter revealed that croaker increased in abundance by almost eight times as compared to that period of 1961. Spot showed little change in abundance for the two quarters, but were slightly more plentiful during October-December 1962.


Croaker
(Micropogon undulatus)

Apparently the only mortality caused by the December cold wave was to fish remaining in shallow waters. Several scattered reports of such kills were made. One report on December 14 indicated that several hundred large winter trout were killed by cold in a small shallow creek entering the Stone River. Another report on December 17 stated that several dead trout and other fish were found in a small canal off Harbor View Road on James Island. Many small 6- to 9-inch trout in shallow experimental ponds at Bears Bluff were killed by low-water temperatures on December 11 and 12. All of those kills, however, took place in very shallow water, and it seems unlikely that any mortality occurred in the deeper creeks and rivers.

Pond Cultivation: Three pond cultivation experiments were completed in October 1962. Results of those experiments were most encouraging and have added valuable information to the knowledge of shrimp culture.

One experiment involved the one-acre "Oyster Pond" which had been drained previously in late June. The floodgates and overflow of that pond were then screened with quarter-inch wire screening and the pond was allowed to fill on the flood tide with water from the nearby creek. This pond was then completely closed off to tidal influence and stocked by hand with juvenile shrimp. During the period of July 18 to August 24, 1962, over 8,000 white shrimp, averaging about three inches in length


White shrimp

were caught in nearby creeks by cast net and stocked in the pond. On August 8, 1962, the pond was treated with rotenone to remove predatory fish. Crab pots were used in the pond throughout the cultivation period to remove crabs. After stocking, the shrimp in the pond were fed on chopped crabs and fish, beginning at the rate of 5 pounds per week and increasing to a maximum of 40 pounds per week previous to harvesting. About 325 pounds of chopped food was placed in the pond during the experimental period.

When the pond was drained on October 18, 240 pounds of shrimp were harvested. The shrimp were about 65 count, heads off. Only a few pounds of crabs and fish were harvested, indicating that the predator control had been effective.

This experiment had been set up to determine the maximum production per acre of a shrimp pond under controlled conditions. Although a good yield of shrimp was obtained, it was felt that production could be improved by increasing greatly the amount of shrimp food. A similar experiment will be carried out in 1963 to determine the effects of increased feeding on shrimp production.

As a comparable experiment to the one above, the one-acre "Fish Pond" was drained also in late June and the same methods of predator control, feeding, etc., were used as for the "Oyster Pond." However, no screens were placed on the floodgates and the gates were allowed to remain open for tidal flow from June 26 to August 1, 1962. The pond was thus allowed to stock naturally with postlarval and juvenile shrimp, and no stocking was done by hand. On October 18, 1962, when the pond was drained, 146

pounds of 47 count (heads on) shrimp were harvested, along with only a very few pounds of fish and crabs.

In a third experiment, a small one-tenth acre pond was used. The pond had been drained, screened, and refilled early in the year and was then closed off completely and stocked with postlarval shrimp from plankton tows during the period of June 25 to August 8, 1962. The pond was treated with rotenone in August and was drained on October 29. About eight pounds of shrimp and almost no fish were harvested. Although the equivalent per-acre yield for the pond was only about 80 pounds, the experiment indicates that the method of stocking used may have possibilities.

Construction of a $2\frac{1}{2}$-acre experimental pond at Bears Bluff was completed during the quarter. The pond was allowed to fill with tidal water in early November and is being stocked with small winter trout, channel bass, tarpon, and flounder.

Note: See Commercial Fisheries Review, November 1962 p. 45.

Swordfish

NEW LONG-LINE FISHERY OFF SOUTHERN NEW ENGLAND SHOWS PROMISE:

The possibility of using long-line gear for catching swordfish in New England offshore waters was indicated when catches of swordfish were made by the research vessel Crawford of the Woods Hole Oceanographic Institute in 1961. The vessel was on an exploratory cruise fishing for tuna with long

lines. The cruise was made in cooperation with the U. S. Bureau of Commercial Fisheries North Atlantic Fisheries Exploration and Gear Research Base at Gloucester, Mass.

Those catches and limited fishing by Canadian fishermen off Nova Scotia with converted halibut long-line gear led to the Bureau and the Institute undertaking another cooperative cruise using long lines for swordfish. The cruise, made in June 1962 with the Bureau exploratory vessel Rorqual, resulted in the capture of only one swordfish because of the numerous sharks in the fishing area. The sharks were hooked almost immediately after the gear was set.

Cooperative exploratory long-line fishing by the commercial vessel Cap'n Bill III, chartered by the Institute and using the Bureau's long-line gear. Four cruises were made in October and November 1962 in the waters south of Cape Cod, and approximately 26,000 pounds of swordfish were caught. Upon completion of the last experimental charter cruise, the vessel commenced fishing on a commercial basis and, as expected, catches increased considerably.

The Cap'n Bill III as of December 20, 1962, had landed five successful trips consisting primarily of swordfish, but also including a fair number of tuna. The fifth trip by that vessel, which was landed on December 20, last year, indicates the great potential of the new long-line fishery for swordfish. The trip consisting of 366 swordfish and 44 tuna were taken in only nine sets. One set of the long-line gear by the Cap'n Bill III caught 91 swordfish. This trip by the Cap'n Bill III undoubtedly sets a new record for the number of swordfish caught, but not necessarily in terms of weight. A second vessel, the Gulf Stream, entered the long-line fishery for swordfish late in 1962. This vessel by the end of 1962 had landed one partial trip and 4 complete trips of swordfish caught by long-line.

The successful trips made by these two vessels has stimulated interest on the part of other vessel owners. As of the end of 1962, five vessel owners were reported to be planning to enter the long-line for swordfish off New England.

Tuna

TAGGING PROGRAM:

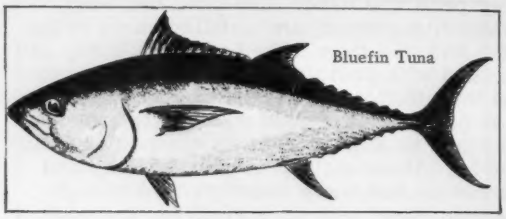
The game fish tagging program by the Woods Hole Oceanographic Institution has been aimed at learning more about the migratory habits and growth patterns of bluefin tuna and other large fish. The Institu-

tion reported on November 9, 1962, that since the start of the program in 1954, scientists and cooperating sportsmen had tagged about 3,000 Atlantic sailfish, 1,300 bluefin tuna, 1,600 white marlin, 225 amberjack, 575 Pacific sailfish, 170 yellowfin tuna, 175 striped marlin, 40 blue marlin, and about 500 fish of various other species. So far, tags have been recovered from 14 Atlantic sailfish, 12 blue-

Senior Ichthyologist of the Woods Hole Oceanographic Institution examining a big-eyed tuna brought in along with several medium bluefin by the research vessel Crawford (seen in background).

fin tuna, 2 white marlin, 28 amberjack, and 1 yellowfin tuna, as well as 3 dolphin, 4 striped bass, 2 jack crevalle, 1 bar jack, 1 barracuda, 1 sea bass, and 1 fluke. Over 1,200 individuals have tagged one or more fish in the program.

The outstanding results of the program have been the returns showing five transatlantic migrations of giant bluefin tuna from off Cat Cay in the Bahamas to Norwegian waters. Two bluefin tuna crossed the Atlantic Ocean in 1961 in less than four months. Another made the journey in 1962 in the fantastic time of only 50 days. As only 77 tuna were marked in the Cat Cay area in the years 1960-1962, it seems certain that at least a large fraction of the giant bluefin passing the Bahamas in those years were migrating to Norwegian waters. This is in marked contrast to the widely held belief that bluefin tuna move from the Bahamas to northwestern Atlantic coastal waters. One



bluefin tuna, in addition to his transatlantic migration, had moved northward through 43 degrees of latitude, from just above the tropics to well inside the Arctic Circle.

The Atlantic bluefin tuna apparently has no home. Successful tagging programs in Norway and Spain have shown bluefin migrations from Norwegian waters to the southern Atlantic coast of Spain, and from there to the Mediterranean coast of France.

A large-scale tagging program is the quickest way to estimate the affect on tuna stocks of the increase in commercial tuna fishing off the Atlantic Coast, according to the scientist in charge of the game fish tagging program of the Institution. For this reason, he recommends intensifying the Institution's current tagging program and expanding the program to include tuna such as yellowfin, blackfin, big-eyed, and albacore, and also oceanic bonito or skipjack.

Note: See Commercial Fisheries Review, February 1962 p. 42.

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U. S. CANNED PACK, 1961-1962:

According to preliminary data, the 1962 canned tuna pack in the United States (including Hawaii, American Samoa, and Puerto Rico) was 5.4 percent greater than in 1961--the albacore or white meat pack was up 14.7 percent and the light meat pack was up 2.4 percent. By canning areas, the increase in the 1962 pack was: California, up 2.6 percent; Washington and Oregon, up 15.9 percent; Atlantic Coast, Hawaii, American Samoa, and Puerto Rico, up 9.5 percent.

The discovery of tuna in commercial quantities in New England waters was an important development in 1962. Seven tuna purse-seiners fishing in the Northwest Atlantic between July and October caught about 3,660 short tons of tuna. The development created interest in building canning facilities on the East Coast. One tuna cannery was built in Maryland during the year.

On the West Coast, there was a striking decline in the important domestic yellowfin tuna catch. Yellowfin tuna landings in California amounted to only 63,490 tons in 1962,

U.S. Canned Tuna Pack, 1961-62

Area	1/1962 White Meat (Albacore)	1/1962 Light Meat	1/1962 Total	1961 White Meat (Albacore)	1961 Light Meat	1961 Total
	(Standard Cases)					
California	2,003,000	8,821,000	10,824,000	1,619,071	8,926,497	10,545,568
Wash. & Oregon	860,523	601,482	1,462,005	797,261	464,405	1,261,666
Atlantic Coast	238,454	539,623	778,077			
Hawaii, American Samoa, & Puerto Rico	1,360,000	2,200,000	3,560,000	2/ 1,475,099	2/ 2,485,371	2/ 3,960,470
Total	4,461,977	12,162,105	16,624,082	3,891,431	11,876,273	15,767,704

1/Preliminary.
2/Atlantic Coast, Hawaii, American Samoa, & Puerto Rico combined.

down 36.7 percent from landings of 100,189 tons in 1961. Throughout 1962, domestic yellowfin tuna landings lagged behind those in the previous year. In the last three months of 1962, fishermen reported that tuna were extremely scarce in the high-seas fishery off Central and South America. The decline in yellowfin landings was partly offset by increased domestic landings in 1962 of albacore (up 22.2 percent), bluefin (up 54.0 percent), and skipjack (up 25.7 percent). But the increase in the California tuna pack was achieved only because imports of frozen tuna were heavier and an increase in the pack of chunk-style tuna.

U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, OCTOBER-DECEMBER 1962:

From the beginning of the program in 1956 through December 31, 1962, a total of 1,221 loan applications for $34,042,256 were received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total 645 applications ($15,122,649) have been approved, 422 ($10,994,959) have been declined or found ineligible, 136 ($5,818,677) have been withdrawn by applicants before being processed, and 18 ($480,634) are pending. Of the applications approved, 258 ($1,625,337) were approved for amounts less than applied for.

The following fishery loans were approved from October 1, 1962, through December 31, 1962:

North and Middle Atlantic Area: George DePutter, Sr., Brigantine, N. J., $10,000; Sigvald Osmundsen, Rio Grande, N. J., $6,000.

South Atlantic and Gulf Area: Eugene E. Lewis, Fernandina Beach, Fla., $90,000; Walter A. and David M. Tate, Aransas Pass, Tex., $23,000; Newell F. Allen, Freeport, Tex., $14,500; Emanuel Nagin, Freeport, Tex., $17,500.

Pacific Northwest Area: Theodore A. Whittaker, Ilwaco, Wash., $10,800; Elmer A. Johnson, Poulsbo, Wash., $7,500; Karl Kaldestad, Seattle, Wash., $15,000.

Alaska Area: Warder Nelson Stoaks, Elfin Cove, $4,000; John H. McVicker, Juneau, $2,000; Richard Z. LeMay, Ketchikan, $16,000; Carl J. Guggenbickler, Wrangell, $4,000.

Great Lakes Area: Chambers Bros., Holland, Mich., $15,000; Robert Peel, Saugatuck, Mich., $14,500.

Under the Fishing Vessel Mortgage Insurance Program during the fourth quarter of 1962, commitment to insure mortgage in the amount of $225,000 on a steel trawler was approved for Boston Fishing Boat Company, Boston, Mass. The total approved as of December 31, 1962, under this program (initiated on June 5, 1960) were 12 applications for $1,710,596, covering 24 vessels. Three applications for $198,000 were pending at the end of 1962.

In the Construction Differential Subsidy Program, 4 applications for $190,667 were pending as of December 31, 1962. Two subsidy payments were made during the fourth quarter of 1962, $35,750 to Thomas B. Larsen, New Bedford, Mass., and $151,299 to Boston Fishing Boat Company, Boston, Mass. Since

the beginning of the program on June 12, 1960, 5 applications for $507,646 have been approved for construction of trawlers to operate in the New England groundfish fishery. The amount approved for the subsidy is about one-third of the cost of each vessel.

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NEW LARGE STEEL TRAWLER ADDED TO BOSTON FLEET:

The Boston, Mass., fishing fleet added its first large steel trawler in over 12 years, when the 124-foot Massachusetts was delivered to its owner on December 12, 1962. The owner of the new vessel is a corporation made up of 28 Boston area firms and individuals long associated with the ownership or servicing of fishing vessels.

The trawler was built by a Sturgeon Bay, Wis., shipbuilding firm at a cost of about $454,000. Construction of the new vessel was aided by the Vessel Subsidy Program of the U. S. Bureau of Commercial Fisheries with a grant of about $151,300. Additional financing amounting to $225,000 was provided by a large Boston insurance company, and that loan is insured by the Mortgage Insurance Program also administered by the Bureau.

The Massachusetts is being used in the fishery for groundfish (cod, haddock, hake, cusk, pollock, and ocean perch). It has a fish hold capacity of about 250,000 pounds and carries a crew of about 17. Customary fishing cruises last 7 to 9 days in the summer and as long as 12 days in the winter.

An identical vessel is under construction in the same Wisconsin shipyard for a Wisconsin firm which operates out of Boston. This vessel, also being partly financed by the Bureau's Fishing Vessel Subsidy Program, will be completed this spring. It will be another modern addition to the older groundfish fleet which, because of obsolescence, is suffering from the competition of newer vessels operating out of foreign countries.

Under the fishing vessel construction grant program up to one-third of the cost of construction of a fishing vessel can be financed by the Federal Government. This is to offset the lower construction costs on vessels built in foreign shipyards.

U. S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS, THIRD QUARTER 1962:

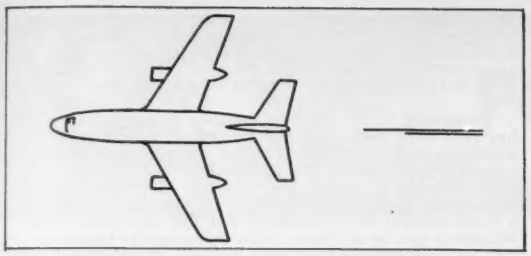
Airborne fishery imports into the United States leveled off in September 1962 after increasing in July and August due mainly to larger shipments of shrimp. Airborne imports of northern lobsters from Canada dropped to 54,961 pounds in July and then stopped completely. They were replaced by airborne shipments of spiny lobsters from Caribbean and Central American countries which amounted to 115,736 pounds in August and 54,349 pounds in September. Fish fillets from Mexico was the leading finfish product imported by air in the third quarter of 1962.

Raw headless shrimp made up the bulk of airborne shrimp imports--in July, shipments consisted of 617,228 pounds of fresh or frozen raw headless, 56,881 pounds of frozen peeled and deveined, and 95,261 pounds of unclassified shrimp; in August, shipments consisted of 886,496 pounds of fresh or frozen raw headless, 131,510 pounds of peeled and deveined, and 660 pounds of unclassified shrimp; and in September, shipments consisted of 507,023 pounds of fresh or frozen raw headless, 42,056 pounds of frozen peeled and deveined, and 1,500 pounds of unclassified shrimp. Over 80 percent of the airborne shrimp imports in July, August, and September entered through the U. S. Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Laredo (Tex.), Los Angeles (Calif.), and New York City.

U. S. 1/ Airborne Imports of Fishery Products, January-September 1962

Product and Origin 2/	July		August		September		Jan.-Sept.	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	Lbs.	US$	Lbs.	US$	Lbs.	US$	Lbs.	US$
Fish:								
Azores	-	-	-	-	25,654	5,672	25,654	5,672
Portugal	-	-	-	-	12,125	3,500	12,125	3,500
Canada	-	-	-	-	-	-	21,317	16,948
Mexico	93,411	12,631	109,583	22,252	138,299	22,246	691,542	121,467
France	124	200	-	-	-	-	274	863
Rumania	-	-	-	-	-	-	1,231	11,287
Panama	-	-	-	-	-	-	7,807	1,312
Norway	-	-	-	-	-	-	223	449
Denmark	99	261	-	-	-	-	99	261
Costa Rica	5,578	861	-	-	-	-	5,578	861
British Honduras	-	-	8,775	2,323	5,950	1,428	14,725	3,851
Total fish	99,210	14,153	118,357	24,475	182,028	32,846	780,598	166,071
Shrimp:								
Guatemala	14,125	6,575	62,167	29,638	30,580	15,528	230,175	115,303
El Salvador	77,027	44,272	70,723	39,946	56,957	31,131	467,112	292,757
Nicaragua	100,557	32,833	85,166	27,773	2,671	1,500	979,872	330,158
Costa Rica	37,734	17,137	75,906	31,104	65,274	25,697	327,691	138,828
Panama	170,545	105,262	278,165	144,937	295,804	181,591	1,423,170	776,268
Venezuela	369,382	214,188	446,450	251,752	502,360	295,132	2,482,426	1,343,422
Ecuador	-	-	-	-	-	-	12,210	3,440
Mexico	-	-	-	-	-	-	14,748	9,952
Netherlands Antilles	-	-	-	-	-	-	3,078	2,722
Total shrimp	769,370	420,067	1,018,666	525,150	953,646	550,579	5,950,481	3,011,950
Shellfish other than Shrimp:								
British Honduras	9,360	7,114	56,830	29,756	35,682	22,567	177,212	102,301
Honduras	-	-	52,800	32,960	-	-	113,003	80,666
Costa Rica	-	-	-	-	-	-	1,400	1,247
Panama	-	-	-	-	-	-	1,040	1,011
Jamaica	-	-	-	-	-	-	30,014	21,324
Netherlands Antilles	624	783	-	-	15,314	9,823	31,196	19,856
Venezuela	-	-	-	-	-	-	22,283	13,624
Mexico	2,268	1,072	18,692	12,346	3,353	3,120	53,819	33,573
Guatemala	-	-	1,100	710	-	-	8,470	4,990
Leeward and Windward Islands	1,232	548	2,333	1,034	-	-	22,911	6,660
Nicaragua	-	-	798	274	-	-	1,186	555
Japan	-	-	-	-	-	-	26	330
France	37	101	-	-	-	-	361	1,038
Colombia	285	1,264	56	220	-	-	1,763	5,110
Ecuador	700	448	-	-	-	-	1,940	1,152
Canada	54,961	20,740	-	-	-	-	223,442	90,880
El Salvador	-	-	336	237	-	-	831	479
Trinidad	-	-	-	-	-	-	2,330	371
Dominican Republic	6,631	4,830	572	550	14,886	14,644	22,078	20,224
Bahamas	-	-	1,887	837	-	-	1,982	837
Peru	-	-	92	204	-	-	92	204
Tot. shellfish (exc. shrimp)	76,088	36,400	135,496	79,128	69,235	50,354	717,068	408,632
Grand Total	944,668	470,620	1,272,519	628,753	1,204,909	633,779	7,448,147	3,586,653

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
2/When the country of origin is not known, the country of shipment is shown.
3/Gross weight of shipments, including the weight of container, wrappings, crates, and moisture content.
4/F.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
Note: These data are included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, July, August, and September 1962, U. S. Department of Commerce.



Shrimp accounted for 79.9 percent of the quantity and 84.0 percent of the value of airborne imports of fishery products in the first nine months of 1962. All of the U. S. airborne shrimp imports during the first nine months of 1962 originated in Central and South American countries. The leading suppliers of airborne shrimp imports in January-September were Venezuela with 42.4 percent, Panama with 23.9 percent, and Nicaragua with 16.5 percent.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports is fresh and frozen products.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-December 1, 1962, amounted to 51,796,996 pounds (about 2,466,524 std. cases), according to data compiled by the Bureau of Customs. This was only slightly below the 52,024,510 pounds (about 2,477,358 std. cases) imported during January 1-December 2, 1961.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty is limited to 59,059,014 pounds (about 2,812,334 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.

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EDIBLE FISHERY PRODUCTS, NOVEMBER 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in November 1962 were up 0.8 percent in quantity but down 0.5 percent in value from those of the previous month. A large increase in imports of frozen tuna (increase mostly from Japan and Peru) was about offset by a sharp decline in imports of ocean perch fillets (decline mostly from Canada), canned sardines not in oil (decline mostly from South Africa), and canned oysters (mostly from Japan).

Compared with the same month in 1961, the imports in November 1962 were up 1.4 percent in quantity and 7.1 percent in value. There was a sizable increase in November 1962 in imports of fish blocks or slabs (increase mostly from Norway and Iceland), frozen tuna other than albacore (increase mostly from Japan and Peru), and frozen shrimp. But imports were down for frozen salmon (mostly from Canada), canned salmon (mostly from Japan and Canada), canned sardines in oil and not in oil, and frozen albacore tuna, canned tuna in brine other than albacore.

In the first 11 months of 1962, imports were up 15.3 percent in quantity and 26.1 percent in value as compared to the same period in 1961. The greater increase in value was because of the higher prices which prevailed in 1962 for most imported fishery products. Most fishery products were imported in greater quantity in 1962 and imports were up substantially for fish blocks or slabs, frozen tuna (increase mostly from Japan and Peru), canned sardines in oil, frozen shrimp, and sea scallops. Imports were down for the following products: haddock fillets, fresh and frozen salmon, canned salmon, canned albacore tuna in brine, canned bonito and yellowtail, and canned crab meat.

U. S. Imports and Exports of Edible Fishery Products, November 1962, with Comparisons

Item	Quantity				Value			
	Nov.		Jan.-Nov.		Nov.		Jan.-Nov.	
	1962	1961	1962	1961	1962	1961	1962	1961
	(Millions of Lbs.)				(Millions of $)			
Imports:								
Fish & Shellfish:								
Fresh, froz. & processed 1/	102.3	100.9	1,083.2	939.1	36.2	33.8	366.1	302.5
Exports:								
Fish & Shellfish:								
Processed only 1/ (excluding fresh & frozen)	3.5	3.9	30.8	23.9	2.0	1.9	13.9	12.1

1/ Includes pastes, sauces, clam chowder and juice, and other specialities.

Exports of processed fish and shellfish from the United States in November 1962 were down 2.8 percent in quantity from those in the previous month. But the value of the exports in both months was the same. In November, there was a modest decline in exports of canned salmon, canned sardines in oil and not in oil, and canned squid. The decline was about offset by an increase in exports of canned mackerel and the higher-priced canned shrimp.

Compared with the same month in 1961, the exports in November 1962 were down 10.3 percent in quantity, but up 5.3 percent in value. Exports of canned shrimp and canned squid increased in November, while exports of canned mackerel, canned salmon, and canned sardines not in oil declined.

Processed fish and shellfish exports for the first 11 months of 1962 were up 28.9 percent in quantity, but the value was up only 14.9 percent as compared with the same period of 1961. Exports of the lower priced canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, and canned sardines in oil. But there was a small decline in exports of canned shrimp (decline mostly in exports to Canada and the United Kingdom) and canned sardines not in oil (decline mostly in exports to the Philippines). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada).

Wholesale Prices

EDIBLE FISH AND SHELLFISH, DECEMBER 1962:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in December 1962 rose 2.2 percent from the preceding month due primarily to a sharp increase in prices for fresh drawn and filleted haddock at Boston following some extremely bad weather on the New England fishing grounds. As compared with December 1961, prices were up 4.5 percent because of generally higher prices for most of the fishery products included in the index.

The drawn, dressed, and whole finfish subgroup index in December 1962 was up sharply (increased 10.2 percent) from the previous month and up 15.7 percent from December 1961. Much higher prices in December 1962 for large drawn haddock (up 64.9 percent) at Boston plus a 2.3-percent increase for round fresh whitefish at Chicago more than offset a slight decline (1.9 percent) for dressed frozen halibut at New York City. Compared with December 1961, wholesale prices were up quite sharply for all items in the subgroup except those for Great Lakes fresh round yellow pike (down 14.9 percent).

A sharply higher price in December 1962 for fresh small haddock fillets at Boston (up 17 cents a pound or 40.2 percent) was responsible for the increase (3.6 percent) from November to December 1962 in the fresh processed fish and shellfish subgroup index. Fresh shrimp prices at New York City were up slightly (about one cent a pound) from the preceding month and fresh shucked oysters (standards) at Norfolk rose 1.6 percent. The December 1962 subgroup index was up 11.2 percent from the same month of 1961 because of much higher prices for fresh small haddock fillets (up 82.5 percent) at Boston and fresh shrimp (up 14.8 percent) at New York City.

Processed frozen fish and shellfish prices in December 1962 were lower by 3.6 percent from the previous month because of a further decline of 5.1 percent in frozen shrimp prices at Chicago (declined 4.0 percent between October and November 1962). In addition, frozen flounder fillets at Boston dropped 3.7 percent or one cent a pound between mid-November and mid-December 1962. Wholesale prices at Boston from November to December 1962 were unchanged for frozen haddock fillets and only fractionally lower for frozen ocean perch fillets. As compared with December 1961, the subgroup index for December 1962 was up 10.9 percent. Prices in December 1962 were higher by 12.6 percent for frozen shrimp, 8.1 percent for frozen ocean perch fillets, 10.7 percent for frozen haddock fillets, and 2.6 percent for frozen flounder fillets.

Canned fishery products prices in December 1962 were unchanged from the preceding month, but were 9.0 percent lower than in December 1961. Compared with December a year earlier, canned fish prices were lower for all the products in the subgroup index--canned Maine sardines down 24.4 percent, canned light meat tuna down 3.2 percent, canned pink salmon down 8.9 percent, and canned California sardines down 10.0 percent. Packs of canned fish items in this subgroup were all good in 1962, except for California sardines which yielded the lowest pack on record.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1962 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes 2/ (1957-59=100)			
			Dec. 1962	Nov. 1962	Dec. 1962	Nov. 1962	Oct. 1962	Dec. 3/ 1961
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					120.9	118.3	119.0	115.7
Fresh & Frozen Fishery Products:					127.6	123.7	124.3	113.3
Drawn, Dressed, or Whole Finfish:					133.1	120.8	120.7	115.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.18	.11	143.8	87.2	82.2	109.3
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.43	.44	127.1	129.6	129.6	105.0
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.97	.96	135.2	134.5	136.2	120.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.69	.68	103.0	100.7	108.2	94.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.54	.54	88.5	88.5	77.8	104.0
Processed, Fresh (Fish & Shellfish):					128.5	124.0	123.8	115.6
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.58	.41	139.6	99.6	92.3	76.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.05	1.04	123.1	121.9	122.5	107.2
Oysters, shucked, standards	Norfolk	gal.	7.88	7.75	132.8	130.7	130.7	132.8
Processed, Frozen (Fish & Shellfish):					116.4	120.7	122.7	105.0
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.41	100.1	103.9	100.1	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.37	107.0	107.0	105.5	96.7
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.34	117.5	118.3	110.4	108.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	1.03	1.09	122.2	128.7	134.0	108.5
Canned Fishery Products:					109.4	109.4	110.2	120.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	25.50	25.50	111.1	111.1	111.1	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	4.50	101.6	101.6	118.5	112.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	9.31	119.4	119.4	116.9	157.9

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ Beginning with January 1962 indexes, the reference base of 1947-49=100 was superseded by the new reference base of 1957-59=100.

3/ Recomputed to be comparable to 1957-59=100 base indexes.

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FOREIGN

International

EUROPEAN ECONOMIC COMMUNITY

ST. PIERRE FISHING BASE PLANS TAKE SHAPE:

Considerable interest is being shown by fisheries representatives of private industry in the European Economic Community (EEC) countries in establishing a base in St. Pierre for fishing craft belonging to member countries of EEC. Three committees from the fishing industries in the Common Market countries are meeting on the financial and technical phase of the project. The base would serve primarily as a supply and repair port for the Common Market country vessels and as a point of transshipment of catches.

The plan for the project, including establishment of an organization to carry it out, are to be completed by the end of 1963.

Although sitting in on the earlier meetings, Italian representatives have stated they no longer are interested in the project. Places on the committees and in the project are being reserved for Denmark, Norway, and the United Kingdom, if they are interested and become EEC members.

The Directors of the European Economic Community (EEC) Overseas Development Fund are reported to have agreed provisionally to invest about US$3.5 million in the first stage of the scheme for improving the harbor and fish receiving facilities of Saint Pierre, capital of the St. Pierre et Miquelon Islands, off southern Newfoundland. France, and the territorial government, will invest a further sum for ancillary shore facilities and a private group of French, Belgian, German, and Dutch fish processors will install filleting and cold-storage equipment.

The proximity of this improved facility to the Grand Banks, Newfoundland, and other rich fishing areas, will permit French and other trawlers (possibly including United States vessels) to use more of their time fishing and less traveling.

The first stages envision lengthening the seawall of the Ile aux Moules and construction of a new, second, freezing plant capable of handling some 18,000 metric tons of fish per year for producing about 5,000 tons of frozen fillets. The frozen storage capacity would be 1,200 tons. An associated factory would produce fish oil and about 2,500 tons of fish meal yearly.

The edible fish products produced by the new facility will be, in the first stage, destined for French and other European markets, but the possibilities of shipments to the United States are also believed to have been considered. (From European Regional Fisheries Attache, United States Embassy, Copenhagen, December 5, 1962; United States Embassy, Paris, December 16, 1962.)

EUROPEAN FREE TRADE ASSOCIATION

COMMITTEE WEIGHS FURTHER TARIFF CUTS:

The European Free Trade Association (EFTA) Consultative Committee, consisting of some 40 industrialists and trade union representatives from the seven member countries and from Finland (an associate member), gave favorable consideration at its December 4-5, 1962, meeting in Oslo to the further reduction of intra-EFTA tariffs. As scheduled, all member countries were to reach the halfway mark in tariff slashes by the end of December 1962, a point which (according to the Stockholm Convention which established EFTA) was to have been reached by January 1, 1965.

Discussing the progress within EFTA and the developments in the field of European in-

International (Contd.):

tegration since the last meeting of the Committee May 24, the Secretary-General noted that the reduction of intra-EFTA tariffs well in advance of the timetable laid down in the Stockholm Convention had been achieved with great advantage to the member nations and without injury to any facet of their economies. The delegates expressed the opinion that the reduction of tariffs should proceed, and requested the EFTA secretariat to make studies concerning a program of further tariff dismantlement.

The delegates discussed the American Trade Expansion Act of 1962, the implementation of which was seen as largely dependent upon some measure of agreement between EFTA and the EEC. The view was expressed that this in itself was an important factor, showing that the Americans were optimistic about the future of European integration.

The delegates felt that continued reduction of intra-EFTA tariffs would be of great help to their individual economies when the time came for integration with the EEC. It was reported that the reductions had already cut prices and stabilized the cost of living, and that further cuts would be even more beneficial to consumers. (EFTA Reporter, December 11, 1962.)

EUROPE

EUROPEAN FISH PRODUCERS ASSOCIATION (EUROPECHE) PLANS FOR FUTURE:

EUROPECHE, an association of national organizations of fish producers in the European Economic Community (EEC) countries, was established in May 1962. The membership is made up of three national organizations of fish producers in West Germany, and one each in Belgium, France, Italy, and the Netherlands. The headquarters office of the Association is located in Brussels, but its Secretary maintains offices in Oostende, Belgium. EUROPECHE aims to reach a common view on fisheries problems resulting from its activities and to make those views known to the EEC organizations.

EUROPECHE hopes to be a liaison organization between EEC or Common Market fish producers and the EEC--especially the EEC Commission. The nine-member Commission must "supervise the gradual establishment of a full Common Market, in which trade restrictions of all kinds will be abolished, and all goods, services, labor, and capital will circulate freely, and in which rules of fair competition are observed. Above and beyond that the Commission must work out and implement common policies for agriculture (includes fisheries), transport, and external trade, and work with the Council of Ministers towards common economic, monetary, and labor policies."

The Association recognizes that the Common Market alone cannot solve its fisheries problems without contact with other countries. EUROPECHE hoped to accomplish this through a modus vivendi with the United Kingdom and other countries. The Common Market Commission did not permit this but did approve of informal contacts between the Chairman of EUROPECHE and fisheries associations in other countries. The latter are kept informed of developments by this means, and have, on occasion, submitted their written views to the Commission through EUROPECHE. Observers from non-EEC countries may not attend EUROPECHE meetings.

The most important EUROPECHE body is the Board of Direction. It was due to meet in Paris the first week in January to develop a EUROPECHE position for the proposed EEC Fisheries Conference, probably to be held in February, possibly in Scheveningen, the Netherlands, or Stresa, Italy. The Chairman of EUROPECHE will attend the Conference together with similar observers from EEC-wide associations of national organizations of fish canners, fish freezers, and fish meal and oil manufacturers. As yet there is no association of national fish marketing organizations.

The first EEC Fisheries Conference may not accomplish much more than an inventory of the problems. Probably the most important discussions will be on fisheries limits and on national subsidies. There does not appear to be unanimity as to whether an EEC fisheries policy should be a fait accompli before the United Kingdom, Denmark, and Norway are accepted as members.

According to the Association's Chairman, the prevailing EUROPECHE view is that, under the Rome Treaty, fishing vessels of EEC countries may fish in each other's territorial waters under the freedom-of-movement provisions. A three-mile fisheries limit is regarded, for example, as merely a three-mile extension of the land boundary. Fishing vessels would, of course, have to abide by the fishing regulations of the contiguous country.

Such freedom of fishing and landing might well lead to "Euroports" for the fishing industry. These would be the ports which provided the best facilities for handling landings and the highest prices for catches because of processing and distributing or marketing advantages. Such ports would draw vessels from all Common Market countries and might affect the present status of fishing ports to a considerable degree. This and other developments are expected to lead to mergers of smaller producing interests to promote efficiency, obtain capital, and thereby better meet competition.

EUROPECHE, as such, is not directly interested in the contemplated Common Market fisheries base in St. Pierre, the French island just off the East Coast of Canada. However, the Vice Chairman and the Secretary are serving on industry committees which are developing plans for the project. (European Regional Fisheries Attache, United States Embassy, Copenhagen, December 19, 1962.)

FISH MEAL

WORLD PRODUCTION, OCTOBER 1962:

World production of fish meal in October 1962 was 31.4 percent greater than in the same month of 1961, according to preliminary data from the International Association of Fish Meal Manufacturers. World production during the first 10 months of 1962 was reported as 1,810,329 metric tons.

Most of the principal courtries producing fish meal submit data to the Association monthly (see table).

There was a large increase in fish meal production in October in Peru (up 21.1 percent), the United States (up 107.1 percent), Denmark (up 178.2 percent), Norway (up 47.2 percent), and Canada (up 57.5 percent). World fish meal production during the first 10 months of 1962 has been increased by heavier landings of anchoveta in Peru, record landings of pilchards in South Africa, record landings of summer herring in Norway and Iceland, and increased landings of industrial fish in Denmark.

International (Contd.):

World Fish Meal Production by Countries, October 1962

Country	October		Jan.-Oct.
	1962	1961	1962
	.... (Metric Tons)		
Canada	6,096	3,871	64,832
Denmark	12,641	4,544	84,788
France	1,100	1,100	11,000
German Federal Republic	5,444	5,597	61,998
Netherlands	600	900	4,300
Spain	1,949	2,194	21,725
Sweden	672	581	3,758
United Kingdom	5,564	5,105	62,196
United States	30,491	14,721	249,411
Angola	4,780	5,722	24,675
Iceland	357	1,052	92,762
Norway	11,932	8,108	107,239
Peru	92,353	76,269	819,638
South Africa (including South-West Africa)	2,550	4,600	202,007
Total	176,529	134,364	1,810,329

Note: Belgium, Chile, Japan, and Morocco do no report their fish meal production to the International Association of Fish Meal Manufacturers at present.

Peru accounted for 52.3 percent of world fish meal production (for countries listed) in October 1962, followed by the United States with 17.3 percent.

During the first 10 months of 1962, Peru accounted for 45.3 percent of total fish meal production, followed by the United States with 13.8 percent and South Africa with 11.2 percent.

FISH OIL

EUROPEAN MARKET IMPROVED IN DECEMBER 1962:

The fish oil market in Europe improved in the last five weeks of 1962, according to reports from West German and Danish fish oil brokers. At the time of the meeting of the International Association of Fish Meal Manufacturers (IAFMM) in London in October 1962, fish oil prices were at their lowest . One thousand metric tons of semirefined Peruvian fish oil were sold for US$70 per ton (about 3.18 U. S. cents a pound) c.i.f. European port. At the same time German herring oil manufacturers were selling their oil for $67.50 to $72.50 per metric ton (about 3.06-3.29 U. S. cents a pound) (ex-factory) German coast.

About mid-December 1962, semirefined Peruvian fish oil was sold by a German broker (c.i.f. European port) for $88.50 per ton (about 4.01 U. S. cents a pound). The late December 1962 price level was $88 to $90 per ton (about 3.99-4.08 U. S. cents a pound) for Peruvian fish oil and German herring oil was sold for $87.50 per ton (about 3.97 U. S. cents a pound). Sales of Danish fish oil have shown similar increases. United States menhaden oil was sold in December 1962 to Scandinavia for $100 per ton (about 4.54 U. S. cents a pound).

The reasons given for the improved market are as follows: (1) the efforts made in London to stabilize fish oil prices at the time of the IAFMM meeting in October 1962; (2) the purchase of 20,000 tons (the last sizable lot from the 1961 production) of whale oil in Rotterdam by a large British firm; and (3) the normal, low production of European fish oil in the winter. (European Regional Fisheries Attache, United States Embassy, Copenhagen, December 21, 1962.)

FOOD AND AGRICULTURE ORGANIZATION

SOUTHWEST ATLANTIC REGIONAL FISHERIES ADVISORY COMMISSION MEETS:

A meeting of the Regional Fisheries Advisory Commission for the Southwest Atlantic of the Food and Agriculture Organization (FAO) met in Rio de Janeiro, Brazil, December 10-14, 1962. This was the first meeting of this Commission since it was created by the FAO Conference at its 11th Session (October-November 1961). The purpose of the Commission is to advise the FAO on fisheries matters in the southwest Atlantic area, and encourage cooperative action in the exploitation of fisheries resources.

Argentina, Brazil, and Uruguay, the countries eligible to be members of the Commission, were represented at the meeting by official delegates and advisers. Observers from Spain, the United States, Japan, Poland, and UNESCO were also present. H. E. Crowther, Assistant Director, Bureau of Commercial Fisheries, represented the United States as an observer.

The meeting, conducted in Spanish only, followed the usual pattern of having plenary sessions for general discussion and the use of working groups to handle specific subjects. Three working groups were formed: 1. Oceanographic-Biological. 2. Technological-Economic. 3. Technical (to discuss FAO technical assistance programs of the three countries).

Delegates of the three countries worked harmoniously throughout the meetings and agreed on the need for cooperation to improve conditions in the fisheries of the South-

International (Contd.):

west Atlantic. Need was stressed for work in oceanography, marine biology, technology, marketing, and the training of personnel.

Delegates expressed a keen interest in the possibility of receiving assistance through the UN Special Fund. It was agreed that the three countries would submit individual proposals to FAO for financing under the Special Fund, but that the countries would cooperate in carrying out the projects through joint use of equipment and trained personnel.

The next meeting of the Commission will be in early December 1963 in Buenos Aires, Argentina, if approved by that government.

JOINT UNITED STATES-JAPAN COMMITTEE ON TRADE AND ECONOMIC RELATIONS

SECOND MEETING HELD IN WASHINGTON:

The second meeting of the Joint United States-Japan Committee on Trade and Economic Affairs was held at Washington, December 3-5, 1962. The purpose of the meeting as expressed in the exchange of notes betweeen the U. S. Secretary of State and the Japanese Minister for Foreign Affairs dated June 22, 1961, was to exchange information and views in order that appropriate measures could be considered "to eliminate conflict in the international economic policies of the two countries, to provide for a fuller measure of economic collaboration, and to encourage the flow of trade."

The Joint Committee's discussions covered the whole range of United States-Japan bilateral economic relationships and dealt also with certain aspects of the economic relations of the two countries with the rest of the world.

Recognizing the close connection between domestic economic conditions and developments in international economic relations, the Committee considered first the current economic situation in the United States and in Japan. It noted that both countries have been making progress in meeting their recent economic problems. The Committee looked forward to the favorable effect on United States-Japan economic relationships of higher levels of economic activity in both countries.

The Committee reviewed the balance of payments positions of the two countries. It recognized the need to eliminate the deficit in the United States balance of payments, which has its origin in the unique role of the United States in the free world. It noted at the same time that Japan's economic growth, as well as its capability for meeting its international responsibilities, has been periodically threatened by disequilibrium in its balance of payments. It noted the measures being taken by both Governments to restore equilibrium, with special emphasis on export expansion.

The Committee agreed that expanding the volume of world trade would be a controlling factor in dealing with the balance of payments problems of both nations. In the further course of the balance of payments review, the Committee paid special attention to the need for close consultation and cooperation among the major industrial nations with respect to international monetary and financial matters.

In the field of international trade, the Committee emphasized the need for strengthening the multilateral trading system of the free world and for expanding trade between the United States and Japan. The Committee discussed the implications of developments within the European Economic Community for the economies of the United States and Japan. It agreed that an expanding and unified economy in Western Europe, operating on an open and liberal basis, would make a major contribution to the expansion of world trade.

The United States delegation gave a preliminary exposition of the actions the United States expected to take under the recently enacted Trade Expansion Act of 1962. The Japanese delegation welcomed the Act as a reaffirmation of the liberal trading policies of the United States and expressed the hope that it would be the means to the fullest possible extension of open and nondiscriminatory trading in the free world.

The delegations discussed the desirability of a major new negotiation on tariff reductions at the earliest feasible date, to take place under the Articles of the General Agreement on Tariffs and Trade (GATT). They also agreed that tariff reductions arrived at in a new round should be applied in full accordance with the unconditional most-favored-nation clause of the General Agreement and that efforts should be made to secure the participation in the negotiations of all the contracting parties to the GATT on the fullest possible basis. The Committee agreed

International (Contd.):

on the importance of assuring that the value of tariff concessions should not be impaired by quantitative and other nontariff restrictions, whether applied generally or on a discriminatory basis.

In the exchange of views about the bilateral economic relationship between Japan and the United States, Japan's restraints on exports to the United States were discussed and the Japanese delegation expressed the hope that developments in the United States would permit their early relaxation. The Japanese delegation expressed its serious concern over some features of the official procurement policies of the United States Government which have resulted in reduced purchases in Japan. The United States delegation explained the role of these policies in maintaining defense and foreign aid programs, freedom of capital movements, and policies aimed at domestic economic expansion. The Japanese delegation also raised questions with respect to relations in the fields of shipping and aviation. On the part of the United States delegation, emphasis was placed on the importance of further trade and exchange liberalization in Japan.

The Committee discussed in detail mutual problems in the fields of agriculture and fisheries. Attention was paid to the role of natural resources in investment and trade between the two countries, with special mention being given to the possibilities for building upon the close geographic link between Alaska and the Pacific Northwest and Japan.

In examining the economic relations of the two countries with other parts of the world, the Committee welcomed the progress that has been made toward the elimination of discriminatory restrictions on Japan's exports and expressed the hope that remaining restrictions of this kind would be removed at an early date.

The United States delegation expressed the strong support of the United States Government for fuller participation by Japan in the Organization for Economic Cooperation and Development (OECD) and stated that it favored full Japanese membership in that organization in the near future.

The Joint Committee agreed that both Japan and the United States should continue and coordinate their efforts to assist economic progress in the developing countries. The members reviewed current levels of assistance and expressed their understanding of the urgent need for an expanding volume of financial and technical aid. The delegations also discussed the desirability of expanding the resources of the International Development Association and expressed their intention to support such expansion.

Attention was also given to the need of the developing countries for greater export earnings. The Committee considered that means should be found to provide the developing countries with improved and nondiscriminatory access to the markets of the industrial countries. It was noted that technical assistance might be devoted to improving the marketability of the export products of the developing countries.

In reviewing their deliberations, the members of the Committee unanimously expressed the belief that the annual meetings are of great value in furthering mutually beneficial economic relations between the two countries, to which both governments attach major importance. Both delegations look forward to the continued development of the Committee as an effective instrument to carry out the high purposes for which it was established.

INTERNATIONAL LABOR ORGANIZATION

FISHING INDUSTRY WORK RULES DISCUSSED AT GENEVA MEETING:

Working conditions in the world's fishing industries were discussed by a special technical committee of the International Labor Organization (ILO), at a December 10-19, 1962, meeting at Geneva, Switzerland.

The objective of the meeting was to lay the groundwork for possible international conventions covering crew accommodations and safety, accident insurance, vocational training, and certificates of competency. If the committee presents draft conventions to the ILO, they will later be considered by the International Labor Conference, which is the periodic meeting of delegates from 104 nations, including the United States, to discuss world labor problems.

Thomas Rice, assistant to the Commissioner, Fish and Wildlife Service, U. S. Department of the Interior, and Charles Jackson, former general manager of the National Fish-

International (Contd.):

eries Institute, participated as members of the committee.

Rice served as a Government member of the committee and Jackson as an employer representative. There are 18 members of this special committee, six each from labor, management, and government, selected from various member nations of ILO.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FIFTH MEETING OF FISHERIES COMMITTEE:

The Fifth Meeting of the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) was held in Paris, France, October 22-24, 1962. Seventeen countries and FAO were represented at the meeting. The United States representative was A.W. Anderson, Regional Fisheries Attache for Europe.

Most of the meeting was devoted to a careful review of draft papers on subsidies and other financial supports to fishing industries in Canada, Denmark, Germany, Norway, Portugal, Sweden, Turkey, and the United States. The various reports will be redrafted in accord with modifications offered by the Committee.

A report was also made to the Committee on a proposed meeting of experts to deal with the promotion and harmonization of quality standards for deep-frozen fish. The meeting was scheduled to be held in Hamburg December 17-19, 1962.

The Committee also adopted recommendations to the Council of the OECD regarding the operational program for 1963 and technical assistance in less-developed countries. Program proposals for calendar year 1963 include the following operational projects:

Continuation of activities started in 1962:

1. Promotion of quality standards for deep-frozen fish and the study of their harmonization (i.e., changing present standards of member nations so as to achieve uniform standards of quality for frozen fish within the OECD).

2. Promotion of quality standards for canned fish.

3. Development and improvement in methods encouraging fish consumption. (A study and report on this subject is now in process.)

New activities:

1. Study of economic factors involved in the rational exploitation of the resources of the sea. (This study entails (1) a preliminary analysis of the present situation for, and prospects on, the economic utilization of the resources of the North Atlantic and (2) a synthesis of the results of previous studies in this field and the status of any practical use made of these studies.)

2. Improve commercial information on fisheries. (Includes a study on the establishment of a market-news type service in European countries.)

3. Development of a detailed multilingual nomenclature of the different species of fish and varieties of fish products entering international trade.

The next meeting of the OECD Fisheries Committee is tentatively scheduled for the end of January 1963.

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PUBLICATION ISSUED ON SANITARY REGULATIONS FOR FISHERY PRODUCTS:

The fishing industry of the United States and of other nations of the Organization for Economic Cooperation and Development (OECD) should derive assistance from the recent OECD publication, "Sanitary Regulations for Fish and Fish Products." The document is a detailed study of the regulations used by OECD member governments to exercise control over health and sanitary factors in the production of fish and fish products.

The study was undertaken on the assumption that, although sanitary regulations are essential for the protection of the health and welfare of the consumer, it is also possible that the regulations may hinder the free flow of trade. Unless administered in a reasonable and practical manner and unless uniform quality standards are established and accepted by OECD member countries, it is believed that conflicting regulations could be detrimental to the movement of fishery products in international markets.

The OECD instituted the study by investigating the sanitary regulations for fish and fish products in force in the United States, Canada, and the 18 European nations in the organization. In 1960, a special consultant was hired to conduct the study. In December 1961, experts from the OECD countries held a meeting to examine the consultant's draft report; to analyze the scientific, technical, and economic factors which have been responsible for the establishment of the sanitary regulations now in force in member countries; and to determine the practical measures to be taken to establish uniform standards of quality that would be accepted by the member countries. These data presented at the meeting, including the consultant's report and the conclusions and recommendations of the experts, are included in the publication.

Note: Sanitary Regulations for Fish and Fish Products, OECD Document No. 51, may be purchased from OECD Regional Office, Suite 1223, 1346 Connecticut Avenue NW., Washington 6, D. C. Price is $1.50.

Australia

AID FOR FISHERIES PROPOSED BY GOVERNMENT:

The Australian Commonwealth Government has agreed to subsidize private fishing enterprises if their prospects are reasonably bright, a conference of State Fisheries Ministers was told in Sydney.

The Government is interested in soundly-based schemes. It will not assist fly-by-night projects. One condition for Commonwealth aid is that the company must also operate outside State territorial waters.

If such schemes, however, haven't the capital to get under way, the Government is prepared to buy shares in the company and then sell them on the open market when the company is on its feet.

Several projects suggested by the various States at the Sydney conference will be considered, in priority, by the Commonwealth.

Among the projects for which aid is sought are the development of a tuna fishery in northwest Western Australian and tuna and shrimp fisheries in Queensland.

Finance for such schemes will come from the Fisheries Development Trust Fund which was established several years ago when the Commonwealth sold its whaling station at Carnarvon, Western Australia.

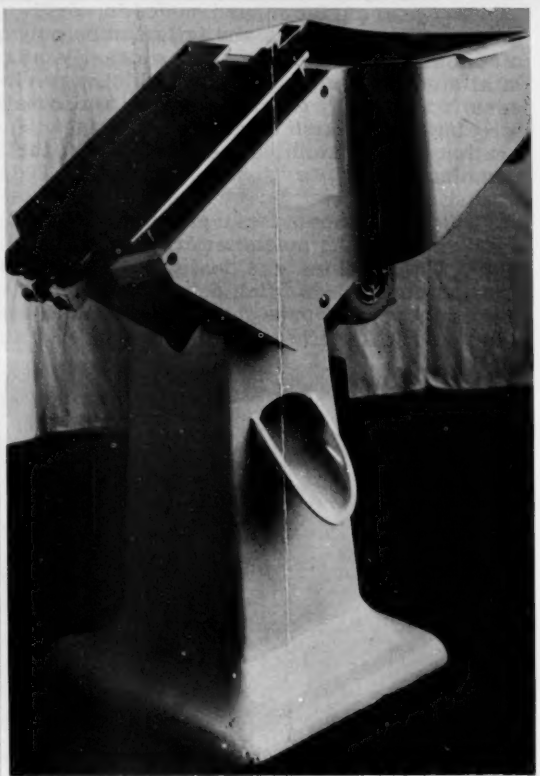
The conference considered a series of proposals on fisheries research, development and administration, and discussed the need for uniform regulations for the management of fisheries.

The Minister for Primary Industry told the conference that Commonwealth funds would be provided to bring an international expert to Australia to advise on fishing vessel design. The States will be asked to contribute to the cost of the visit. (Australia Fish Trades Review, October 1962.)

Belgium

FILLETING MACHINE DEVELOPED FOR HERRING AND PILCHARD:

A filleting machine designed primarily for herring and pilchard has been placed on the market by a manufacturer in Antwerp, Belgium. The new machine is the result of 15 years of development and practical experience in constructing a filleting machine that is compact, economical, simple to operate, and of minimum weight. It can be easily installed, is rustproof, and is suitable for operation in any temperate or tropical climate.



Filleting machine specially built for sprat and other very small fish.

The machine is of stainless metal, with most parts made of aluminum, has an electric motor of 370 watts, 1,450 r.p.m., 220/380 volts 3-phase a.c., 50 cycles. Can also be furnished with other electrical specifications. Net weight of the machine is about 88 pounds. It needs only 10 square feet of factory space when installed. A special feature of the machine is that it produces very little noise--only a slight hum from the motor and the cutting of the fish.

The machine cuts butterfly-type fillets, and can also cut single fillets by simply turning a knob. A trained operator will be able to fillet about 3,600 herring an hour. If heads

Belgium (Contd.):

are to be removed during the filleting operation, the output is about 2,000 herring an hour. Some of the characteristics of the machine are that it automatically adjusts itself to various sizes of fish when unsorted fish are fed into it. It is capable of cutting all types of herring from hard-cured to very soft matjes, and heads and tails can be cut off if desired. Also, the machine easily cuts mutilated fish or pieces without blockage. It uses from 1 to 1½ gallons of water a minute for cleaning the fish during the filleting operation and for sluicing the waste out of the machine.

The Belgian manufacturer has also built a special filleting machine for a German firm. The machine was designed to fillet sprat counting 36-45 fish per pound. The manufacturer believes that model could be adapted to fillet other small fish such as smelt.

The machine will be exhibited at the World Fishing Exhibition to be held in London, England, May 27-31, 1963.

British Solmon Islands Protectorate

FISHERIES DEVELOPMENT, 1962:

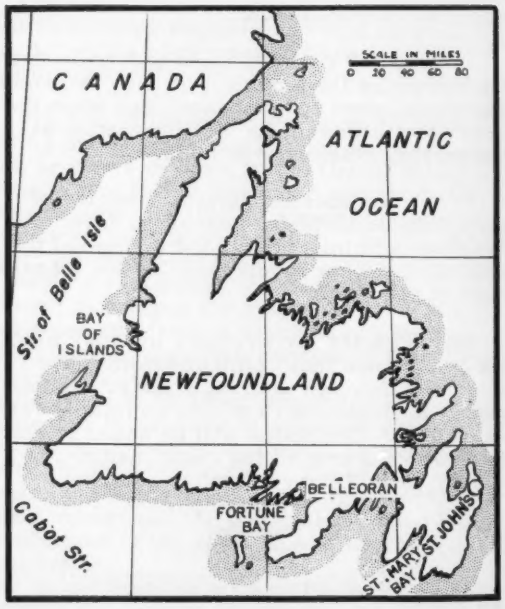
Protectorate authorities are convinced that the waters around the Solomon Islands are filled with fish which could be commercially exploited. Until recently, organized fishing in the Solomon Islands was limited to the efforts of a small cooperative in Honiara and several individuals in the eastern Solomons. In late 1962, an Australian with business interests in the Solomon Islands surveyed the commercial fishing potential of the Solomons. He was trying to determine if live bait could be caught in sufficient quantities to justify a commercial fishing venture. The Australian's business interests in the Solomons include part ownership of a refrigeration plant in Santo.

The Protectorate Government purchased the 45-foot fishing vessel San Juanita in the first part of 1962. The vessel is being used to survey fishing grounds off the Solomons and to teach local people modern fishing methods. In May 1962, the San Juanita landed 15,885 pounds of dressed fish in Honiara. The catch, valued at £A1,200 (US$2,676), was partly caught by fishermen from the local cooperative for whom the vessel acted as a mothership. The Protectorate Government also plans to provide refrigeration for the local fish catch. Fish is important in the Solomon Islanders' diet. To carry out the new program, the Government has established a Fisheries Section in the Department of Agriculture. (United States Consulate, Suva, December 1, 1962.)

Canada

STUDIES AIM TO PREVENT GLUTS IN NEWFOUNDLAND'S SUMMER COD FISHERY:

The extensive spring and summer trap-net cod fishery in Newfoundland presents a singular situation which is now being investigated by the Fisheries Research Board of Canada. This phase of the Newfoundland cod fishery is unique in that the inshore fishermen have full control of the resource for a limited period.



In late spring and early summer vast schools of cod swarm to the inshore waters in pursuit of capelin. These cod come with-

Canada (Contd.):

in the three-mile limit and are thus beyond the reach of both Canadian and foreign trawlers. As the cod gorge themselves on the smelt-like capelin they are caught in trap nets and the heavy catches present a problem of temporary glut. This heavy supply in a short period creates the question of how best to handle it.

The Board's technologists agreed that one solution would be to spread the operation over a longer period. Two factors were considered: (1) the most efficient use of the labor force and (2) the preservation of the cod for processing after the heavy run of the fish comes to an end in August. There are several possible ways in which that can be done.

First of all, fish could be frozen in the round state with heads and viscera removed or partly processed in the form of rough fillets. That would mean that the fish would be filleted without the skin being removed. Later the round fish or fillets could be thawed and processing then completed. The scientists explored two types of freezing. One was the conventional plate freezing and the second brine-freezing. The latter method would permit more rapid thawing by air or water.

Another approach to the problem of keeping the fish was by live-holding. They would be kept in confinement in the traps until ready for use. That would help level off production over a longer period. Although this method has not yet been fully investigated, preliminary results have been encouraging. Scientists found that holding the live fish had no adverse effects on quality.

Methods of thawing were also explored. There are three methods; water, air, and radio-frequency thawing. Known as dielectric thawing, the last method is carried out by an apparatus which transmits radio waves into the fish. The energy is absorbed by the ice in the fish and the thawing is done more speedily than by the air or water methods.

The experiments both in freezing and controlled thawing have thrown light on many problems and the Board was told, at its annual meeting in Ottawa early in January this year, that the outlook for a satisfactory answer to some of the riddles involved in the summer cod invasion of Newfoundland inshore waters is encouraging. (Canadian Department of Fisheries, January 7, 1963.)

* * * * *

BRITISH COLUMBIA
HERRING PRICE DISPUTE SETTLED:

Fishermen's representatives and herring processors in British Columbia signed agreements on November 30, 1962, ending a six-week price dispute. The agreements raised the ex-vessel price of herring used for meal and oil processing from C$10.40 (US$9.67) to C$11.40 (US$10.60) effective December 2, 1962. Under a retroactive agreement, processors will pay an adjustment of C$0.56 (US$0.52) a ton for reduction herring caught under the previous agreement between September 1, 1962, and October 16, 1962. It is reported that under the new agreements the individual fisherman's share of the catch will be raised to C$1.425 (US$1.324) per ton; also,

Off the British Columbia Coast, a Canadian purse-seiner is drawing the net tighter around a good catch of herring.

there is no change in the ex-vessel price of C$16.00 (US$14.88) for herring used for bait and other purposes. ("Facts on Fish," Fisheries Association of B.C., December 1962.)

The price paid British Columbia fishermen for herring to be made into fish meal and oil is not comparable with United States ex-vessel prices since plant operators in Canada own the vessels and gear and provide for most of the operating expenses.

Notes: (1) C$1.0756 equals US$1.
(2) Also see Commercial Fisheries Review, January 1962, p. 45.

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Canada (Contd.):

SCIENTISTS STUDY CHEMISTRY OF THE NORTH ATLANTIC LOBSTER:

Fishery scientists of Canada's Fisheries Research Board research station in Halifax, Nova Scotia, are taking a slightly different look at the highly-prized North Atlantic lobster which brings millions of dollars to Canadian Atlantic Coast fishermen each year. This time the scientists are concentrating their efforts on trying to unravel the mysteries of the creature's chemistry.

A report on the physiological approach to this shellfish with its armor-like shell was given early in January this year at the annual meeting of the Board in Ottawa.

Large holding tanks have been installed in the Halifax Technology Station capable of holding hundreds of lobsters. A long pipeline extends from the Station to the bottom of Halifax harbor to provide a continuous fresh supply of sea water to keep the lobsters alive.

There are many things the scientists hope to find. They are interested in the lobster's moulting process. Each time a lobster sheds its shell its growth and weight increase substantially. Would there be a way to increase the number of moults? That answer in itself would be a big step forward in the field of lobster research.

An important aspect of the whole program, of course, is the lobster's health. Normally, lobsters are healthy creatures, However, like all living creatures they are sometimes affected by disease. That is why the technologists want to know more about the lobster's body chemistry.

In the summer of 1962 there were casualties among lobsters stored in certain tidal holding pounds. The Board's scientists moved in to find out the cause. Samplings were made of lobsters from different districts where the casualties occurred and all indications were that the creatures had been infected with a specific bacterium while still in the sea. With the source of the trouble reasonably well identified, scientists were able to advise necessary steps to help counteract the situation. It is emphasized that this condition is not harmful to humans. (Canada's Department of Fisheries, January 7, 1963.)

* * * * *

REBIRTH OF NOVA SCOTIA WHALING INDUSTRY STIMULATES STUDY OF WHALE OILS:

The rebirth of the whaling industry in Nova Scotia, after a lapse of more than a century has given impetus to a study of whale oil in the laboratories of the Halifax Technological Station of the Fisheries Research Board of Canada. One phase of the project called for a comparative study of the qualities of oil from bottlenose and sperm whales. The two oils were shown to be essentially similar.

Details of the whaling operation and its scientific phase were given in a report submitted to the Board's annual meeting early in January 1963.

The interest in comparing bottlenose and sperm whale oils stemmed from the fact that the Nova Scotia operation is mainly concerned with the former species. The one vessel initially engaged in the project was unable, because of its small size, to hunt and boat the larger sperm whales, which measure up to 50 feet in length. Bottlenose whales were the chief prey of the catcher vessel and about 35 were harpooned last summer.

Although sperm whale oil brings a higher price than oil produced from the bottlenose whale, Halifax scientists have shown that the composition of sperm and bottlenose oils is basically the same. There are a few minor differences, but they are not regarded as of much significance by the Station's technologists. As opposed to ordinary fish oil and whale oil from the blue, fin, humpback, sei, and other whales, the sperm and bottlenose oils are largely, in a chemical sense, waxes. The wax, when extracted, is soft and white. The hard part of the wax separates itself on cooling and is used for cosmetics and medicinal preparations. The residual oil has many uses and has excellent lubricant qualities.

In addition to supplementing knowledge of whale oils generally, the findings of the Halifax scientists could mean economic benefits for the revived whaling operations.

The revival of Nova Scotia's whaling industry is a fascinating sequel to Nova Scotia's whaling history which began in the 1780's. It flourished for about a decade and then died. In the first half of the 1800's it flourished again and then declined to revive again more than a century later in 1962.

Canada (Contd.):

The Nova Scotia whaling operation is still in the experimental stage. Its sponsors hope to increase the effort this spring and are hopeful that more boats will be encouraged to join the industry. (Canada's Department of Fisheries, January 7, 1963.)

Colombia

CERTAIN TYPES OF FISHING GEAR BANNED IN COASTAL WATERS:

By a Decree effective November 9, 1962, the Colombian Ministry of Agriculture prohibits fishing with bottom-trawl nets within a nautical mile of the Colombian coast. Also fishing with gear requiring more than three men is prohibited within three nautical miles of the mouths of most Colombian rivers. Protection of the breeding grounds of certain fish was the reason given for the Decree. (United States Embassy, Bogota, December 5, 1962.)

Denmark

NEW COMMERCIAL COLD-STORAGE FACILITIES IN LIBERIA AND NIGERIA PLANNED:

A Danish firm expects to open two new commercial cold-storage warehouses on the coast of Western Africa in 1963. One will be in Monrovia, Liberia, and one will be in the Port of Apapa, Nigeria. The cold storage in Monrovia is expected to open in May 1963. The Danish firm is presently operating three cold storages in Ghana, two of which are located in Tema and the third in Accra.

France

IMPORTS OF JAPANESE FROZEN TUNA:

Japanese press reports indicated that the special import quota of 3,500 metric tons established in spring 1962 by the French Government to permit the importation in 1962 of Japanese frozen tuna was expected to be filled. As of early December, Japanese exports of frozen tuna to France were said to total 3,300 metric tons and negotiations were being conducted for the delivery of 200 metric tons to fill the French import quota.

Reportedly, yellowfin tuna originally were the main species exported to France. However, following problems concerning their quality, emphasis was placed on exporting albacore. The albacore tuna were reported to have brought a high of $450 a metric ton (c.i.f. France) and as of early December were said to be selling for $420 per metric ton. (Suisan Tsushin, December 5, 1962.)

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SHIPYARDS GET KOREAN ORDER FOR 160 FISHING VESSELS:

Shipyards in Dieppe, France, are reported to have received an order for the construction of 160 fishing vessels for the Government of South Korea, and the report goes on to say that the Dieppe yards could expect more orders in the near future.

The French order is obviously a result of a recent loan of US$120 million by an Italian-French combine for the development of Korea's fishing industry. The agreement embodying this loan is said to call for the construction of over 700 new fishing vessels with an average gross tonnage of 160. Most of them will be built in Europe, but a few are expected to be constructed in South Korea. The motors and equipment for those built in Korea will be shipped from Europe.

When this program is completed it is expected that the South Korean fleet will be about double its present strength.

The Italian-French combine is to train Korean fishermen and technicians and assist in marketing Korean fish and fishery products throughout the world.

This project is expected to boost the annual Korean catch to over 1,000,000 metric tons. (The Korean catch in 1961 amounted to 412,000 tons.) Modern facilities are to be created at six Korean ports for the proper handling and storage of the increased catch. (The Fishing News, London, December 14, 1962.)

Note: See Commercial Fisheries Review, December 1962 p. 77, October 1962 p. 62, August 1962 p. 79.

French Guiana

TWO UNITED STATES FIRMS TO DEVELOP SHRIMP FISHERY OF FRENCH GUIANA:

A fishery firm of Tampa, Fla., has started building a shrimp packing plant at St. Laurent, French Guiana. In November 1962, seven shrimp vessels were on the way to French Guiana to fish the shrimp grounds 60 miles off the coast of French Guiana. Fifty shrimp vessels will be operating off French Guiana within a year, according to the Florida firm's manager at St. Laurent. It is expected that most of the vessels will be from the United States and that the families of the vessels' captains will go to St. Laurent.

The new shrimp-packing plant at St. Laurent will be located at the mouth of the Maroni River. It will be housed in buildings which were formerly part of the St. Laurent Penal Colony. Two large freezers and an ice-making machine are already installed. According to the manager, investment in the plant is now US$225,000 in imported equipment and local construction materials. A shrimp-grading machine will be imported in the near future, and a dock for loading will be built. Shrimp will be graded, packed, and frozen at St. Laurent and shipped to the United States once a month by merchant ship. The new shrimp operation was expected to create jobs for 100 residents of French Guiana before the end of 1962.

Another United States firm is interested in building a shrimp-packing plant near Cayenne, French Guiana. The firm has succeeded in getting $80,000 worth of credits from the French Government for the installation of water lines to their plant site outside Cayenne. (United States Consulate, Martinique, November 30, 1962.)

French Polynesia

IMPROVEMENT OF FISHERIES PLANNED:

Surrounded by a sea abounding in fish and shellfish, French Polynesians have always devoted much of their time to fishing as a principal source of food. However, fishing methods are primitive and fishing is limited to the lagoons, streams, and reefs. Almost all the catch is consumed locally or marketed in the urban centers such as Papeete. It is estimated that 1,000 tons of locally-caught fish are sold annually in the markets of Papeete. However, the local catch has never been sufficient to meet growing demands and the territory imports a considerable quantity of canned fish.

The short supply of local fish is due to the lack of refrigerated shipping or storage in the Islands, and the scarcity of fish close to the major population centers (particularly in the lagoons around Tahiti) depleted. To counter those difficulties, a number of measures have been taken in the past two years. Most of the Territory's fishermen have formed cooperatives to pool financial resources for the purchase of larger vessels, and more modern fishing gear. Also, cooperatives have negotiated a number of loans with Government lending agencies. The Government, in turn, has installed refrigeration equipment in several urban centers for fish storage and introduced ice plants in several islands near the main fishing grounds so that the cooperatives can ice-down their catches for shipment to Papeete and elsewhere.

However, the movement of fish to market remains difficult and the urban centers are still largely dependent on imported canned or frozen fish. The Government hopes during its present five-year development plan to introduce sufficient ice houses, small refrigeration plants, and "ice-boats" to the Territory to eventually make possible self-sufficiency with respect to fish.

The French Government at Papeete has long been interested in introducing offshore

French Polynesia (Contd.):

commercial fishing, fish canneries, and fish byproduct plants. Those would provide increased employment, exports, and would help to expand the narrow base of the Territory's economy. The French Government feels that the sea is one of the Territory's richest but most neglected natural resources. Early in 1962 the Government at Papeete approved a proposal by a United States tuna-canning company to invest CFP70 million (US$795,000) in a fish cold-storage plant near Papeete. At the outset it is planned that 16 Japanese long-line fishing vessels of about 76 tons will supply the plant with tuna. Later, if justified, the fleet would be increased to 40 or 50 vessels and a tuna cannery would be built. It is expected that the frozen fish will be marketed locally, as well as in Japan, the United States, and France. Native fishermen would be protected by prohibiting fishing close inshore and in other traditional native fishing grounds. It is anticipated that this United States firm will begin operations this year.

French Polynesia is a source of the relatively rare "black pearl" type oyster shell. Other sources are the Cook and Fiji Islands. For many years the collection and export of mother-of-pearl shell was uncontrolled and caused serious depletion of the resource. Harvesting and export are now rigidly controlled, but the harvest still fluctuates widely due to fluctuations in world demand and price, but also due to the availability of the best pearl shell.

Shell prices have fluctuated wildly in recent years, and are dependent on economic conditions in the United States and Europe--the Territory's principal markets. However, prices have risen over recent years from a low of CFP45 per kilo (about 23 U. S. cents a pound) in 1951 to a 1962 high of about CFP200 per kilo (about US$1.03 a pound) f.o.b. Papeete. Except for 1958 when the price dropped to a low CFP75 per kilo (about 85 U. S. cents a pound), the value of pearl shell has risen but production has varied considerably and dropped somewhat in the past two years. The Government during 1961-65 plans to spend about CFP7.5 million (about US$85,000) on rehabilitating the pearl shell beds and on the development of pearl-shell oyster culture. The Government hopes to increase annual exports of pearl shell by at least CFP20 million (about US$220,000) annually by 1975. With respect to pearl-shell oyster culture, seeding is now being carried out on an experimental basis in several areas by a Japanese company.

The United States was at one time a primary customer of the Territory's pearl shell exports, but is now second to West Germany due to the introduction in the United States of plastic buttons. (United States Consul in Suva, January 3, 1963.)

German Federal Republic

FISHERIES RESEARCH LABORATORIES:

Because of the accessible fishing grounds off West Germany's Baltic and North Sea coasts plus those in international waters within the range of the deep-water vessels, West Germany has long recognized the value of both applied and basic fisheries research. Fisheries research activities are headed by the Federal Research Station for Fisheries (Bundesforschungsanstalt fur Fisherei) located in Hamburg. This station has five branches and several substations.

German commercial fishermen in 1959 landed 770,000 metric tons of fish and in 1960, 593,000 tons. Only Norway, Great Britain, and Spain surpass Germany as fishing nations in Europe. The fishing industry contributes approximately DM 3.8 billion (US$950 million) each year to the gross national product.

The oldest fisheries research laboratory is the Biologische Anstalt (Biological Station) at Helgoland which was established by Prussia in 1892. Anton Dohrn, the eminent marine biologist, whose descendents still operate the Marine Biological Laboratory in Naples, was the moving spirit in this enterprise, together with Friedrich Heincke. It was absorbed into the Reichsanstalt fur Fischerei (National Fishery Institute) which was founded in 1938 in Berlin. With the downfall of the Third Reich and the formation of the German Federal Republic, the Institute was given its present name and Federal affiliation in 1950.

The Biological Station at Helgoland is primarily concerned with basic research in the field of general marine biology. There are laboratories for zoology, animal physiology, botany, microbiology, fish biology, and plankton studies. In the tradition of marine biological laboratories elsewhere (Naples, Italy, Woods Hole, Mass. etc.), facilities are available for guest investigators, who fre-

German Federal Republic (Contd.):

quently spend summers or longer periods on some specific aspects of marine biology.

In addition to the Biological Station at Helgoland, there are four other branch laboratories located in Hamburg. These are: (1) Institute for Deep Sea Fishing; (2) Institute for Coastal and Inland Fishing; (3) Institute for Netting and Materials Research; and (4) Institute for Fish Processing. The types of activities at each of those institutes are indicated from their names. Virtually all problems of deep-sea and inland fishing are studied, especially the biology of edible fishes plus the seasonal changes of fish availability, development of new means for capture, etc. The Institute for Deep Sea Fishing also maintains a branch laboratory in Bremerhaven, and stations for shoals research in List and Sylt.

Fisheries research is conducted by a staff of 157 (including 124 administrative and technical employees). The budget for 1962 was DM3.0 million(US$750,000), a slight apparent decrease from the DM3.4 million (US$850,000) in 1961. Actually, the allotment for fisheries research was substantially increased over 1961. Over a million DM ($250,000) of the 1961 budget was allocated to completion and purchase of equipment for a new service building. (United States Embassy, Bonn, August 15, 1962.)

Ghana

FISHERIES BILL STIRS DEBATE ON FOREIGN-OWNED TUNA BASE:

The Fisheries (Amendment) Bill, 1962, was debated in the Ghanaian National Assembly on December 4, 1962. The Bill provides that the shares of a company or group of persons engaged in the fishing industry in Ghana must be wholly owned by Ghanaian nationals resident in Ghana, with the exception of a foreign-owned company under contract with the Ghana Government for the purpose of exporting fish to another country.

The international subsidiary of one of the large United States tuna packers signed an agreement with the Government of Ghana in October 1960. The agreement gives the firm the right to process and export tuna in Ghana for a period of 35 years. The firm agreed to train Ghanaians in tuna fishing and to provide other unspecified technical assistance and advice. The firm also obtained an option to build a tuna cannery at Tema within two years if feasible and in the company's interest. The option for the cannery lapsed on October 16, 1962.

The rights of the company under its agreement with Ghana would be protected by the exception in the new Fisheries (Amendment) Bill. During debate on the Bill, a member of the opposition party in Ghana stated, "I do not think it is proper at this time in Ghana when we need fish so badly to allow a foreign firm to export our fish overseas."

In reply, the Ghanaian Minister of Agriculture pointed out that deep-sea tuna fishing is not exploitation of territorial waters. The Minister stated, "The present arrangement (with the United States firm) is more of transshipment than exploitation of our territorial waters. The presence of these vessels in Ghana is beneficial because not only do these vessels use our port facilities, but also the tuna fish which has a limited market here is exported through them. In fact the tuna is more for export than for local consumption. Our own Fishing Corporation has two tuna fishing vessels which are going to be used for tuna fishing for export in order to earn foreign exchange, mostly scarce dollars. The main object of the agreement was in cooperation with our own Fishing Corporation to develop tuna fishing industry.

The Minister of Agriculture also pointed out that agreements must be honored. He explained that the agreement with the United States firm has been referred to the Ghanaian Minister of Justice for review because certain conditions in the agreement had not been honored. (United States Embassy, Accra, December 11, 1962.)

Guatemala

SHRIMP EXPORTS INCREASED SHARPLY IN 1962:

In its annual report on the fishing industry, the Department of Hunting and Fishing of the Ministry of Agriculture reported that Guatemala exported close to 1.9 million pounds of shrimp with a gross value of about US$1.8 million during the year ending November 30, 1962. The Department estimated

Guatemala (Contd.):

that the net value (less commissions, freight, insurance, and other costs) entering Guatemala as foreign exchange was close to $1.6 million. In addition to the shrimp, about 279,000 pounds of other fishery products were landed for local consumption.

During calendar year 1961, Guatemala exported shrimp valued at about $210,000, or only about 11 percent of the value of the shrimp exports made between December 1, 1961, and November 30, 1962. Landings by ports for the year ending November 30, 1962, were: Puerto San Jose, 803,940 pounds of shrimp and 154,709 pounds of fish; Puerto Champerico, 936,600 pounds of shrimp and 115,000 pounds of fish; and Puerto Barrios, 118,931 pounds of shrimp and 9,703 pounds of fish. (United States Embassy, Guatemala City, January 3, 1963.)

Honduras

UNITED STATES FIRM ENTERS SHRIMP AND SPINY LOBSTER FISHERIES:

A United States firm began operating a 140-foot transport vessel in the shrimp and spiny lobster fisheries off the North Coast of Honduras during the latter part of 1962.

The vessel, which is equipped with freezing and ice-making equipment, loads the shrimp and spiny lobster catch of about 40 small boats in the vicinity of Caratasca and transports it to Tela, Honduras. The shrimp and spiny lobster are flown from Tela to Miami, Fla., by a "C-46." The firm expected to make one airborne shipment per week to Miami with about 12,000 pounds of spiny lobsters and shrimp. (United States Embassy, Tegucigalpa, November 29, 1962.)

Iceland

HERRING FISHING CONTRACT DISPUTE SETTLED:

The Icelandic motorboat owners and the seamen approved an agreement which their representatives reached on the South Coast herring share-of-the-catch dispute. The settlement gives the seamen about ½ percent more of the value of the herring catch than the separate Akranes agreement. The earlier agreement in Akranes gave the seamen more than was proposed by Icelandic Government mediators. (United States Embassy, Reykjavik, November 23, 1962.)

Iran

NEW COMPANY TO BE FORMED TO OPERATE IN PERSIAN GULF:

The formation of an Iranian corporation to exploit fisheries in the Persian Gulf has been approved by the Government-owned National Iranian Fisheries Company (Shilat-

Iran). The new company will be capitalized at 100 million rials (US$1.33 million) divided into 10,000 shares. Plans call for the capital to be raised through public subscription, with unsold shares to be purchased by the Government. (United States Embassy, Tehran, November 15, 1962.)

Notes: (1) Values converted at rate of 75.0 rials equal US$1.
(2) See Commercial Fisheries Review, September 1962 p. 80.

Italy

FROZEN TUNA IMPORT QUOTA:

The Italian Government, which set a duty-free import quota of 25,000 metric tons of frozen tuna for 1962, was reported to have decided to allow an additional 7,000 metric tons of frozen tuna to enter duty free into Italy in 1962 in response to a strong appeal made by the Italian National Association of the Fish Canning Industry (Assoconserve). It is said that Italy submitted a request to this effect to the EEC (Common Market) Secretariat. However, the 1963 Italian duty-free import quota is to remain at 25,000 metric tons, but due consideration is expected to be given to possible increases for that year, pending future developments.

Japanese exports of frozen tuna to Italy for the period January-November 1962 are said to exceed 30,000 metric tons. For that portion exceeding 25,000 metric tons, the Italian tuna industry is said to have submitted a guarantee to pay the 7.5 percent ad valorem import duty due on it, pending a decision by the EEC Secretariat on the Italian Government's request for an additional 7,000-ton duty-free import quota. (Suisan Tsushin, December 10, 1962.)

Ivory Coast

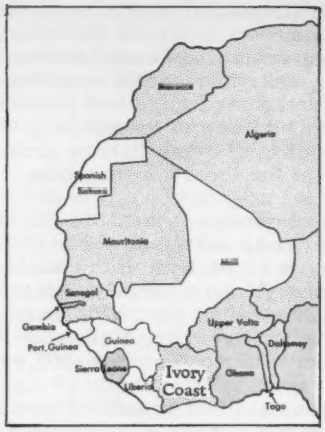
FISHING INDUSTRY EXPANDS:

The numerous activities of the Ivory Coast Fisheries Service, which was created in 1956, have helped develop the fishing industry. The Fisheries Service has trained 40 seamen and 7 master fishermen at its Training Center for local fishermen. The Training Center was opened in 1960.

Ivory Coast: Size of Fishing Fleet and Fishery Landings, 1955-1960

Year	Fishing Vessels	Fishery Landings
	Number of Vessels	Metric Tons
1960	53	29,000
1959	48	25,000
1958	34	25,000
1957	23	15,000
1956	20	9,000
1955	14	5,000

A sardine-tuna fishing vessel is being added to the Ivory Coast fishing fleet with the help of funds from the United States Agency for International Development. Sardine fishing is now the the most important activity of the Ivory Coast fishing fleet, but



tuna fishing is developing rapidly with the construction of refrigeration and canning plants. Several foreign firms have established tuna fishing bases in the Ivory Coast. (United States Embassy, Abidjan, September 26, 1962.)

Note: See Commercial Fisheries Review, August 1962 p. 66, May 1962 p. 52, December 1961 p. 72.

* * * * *

NEW FISHING PORT OFFERS INVESTMENT OPPORTUNITY:

As an integral part of a US$4.8 million project for the construction of a new fishing port, the Ivory Coast Government is planning the construction of a cold-storage plant. It seeks to attract private business investment to finance part of the approximately $3.0 million required for its construction. Several United States fish canners have shown an interest in this project. Investors interested in either the opportunity for participation in the cold-storage plant or the general potential of the fishing industry in Ivory Coast should contact John C. Elliott, Trade Advisor, Ivory Coast Resources Agency, 1270 Avenue of the Americas, New York, N. Y.

The project for construction of a modern fish port is under way: the first phase (involving the construction of a main pier 400 meters or 1,312 feet long, with necessary handling equipment, sorting and auction rooms, and installations for wholesalers) was scheduled to be completed before the end of 1962. The second phase, which will begin after completion of the main pier, will involve construction of the following facilities: (1) an outfitting wharf capable of holding heavy duty lifting and handling machinery;

Ivory Coast (Contd.):

(2) a light duty wharf where vessels can berth for supplies, provisions, fresh water, and carry out light repair and maintenance work; (3) a special dock for tuna fishing vessels; and (4) a network of roads and railroads to the various wharves and the cold-storage plant, which is to be located near the main landing pier.

Since 1957, landings of fishery products have increased from about 22,600 metric tons to 37,000 tons in 1960. The Ivory Coast fishing industry has outgrown its present fishing port facilities. The modern port and cold-storage plant will enable the industry to expand and able to handle landings, an estimated 63,000 tons by 1975.

The planned cold-storage plant will permit a more rational and regular distribution of fish, and will be a stimulus to the tuna fishing industry. (United States Embassy in Abidjan, December 14, 1962.)

Japan

ALBACORE TUNA PRICES IN FALL 1962 REMAINED FIRM:

The late July 1962 decline in frozen tuna prices in the United States resulted in a situation where Japanese-caught tuna were being almost wholly exported to Europe, where demand and prices were good, the Japanaese periodical Suisan Tsushin, of December 15, 1962, stated. Frozen albacore tuna for the United States market were said to be selling for $355 a short ton c.&f. in mid-December 1962, whereas they sold in Europe around $420 a metric ton c.&f. The difference in shipping costs between the two markets can be reduced by utilizing tramp steamers for shipments to Europe, states the periodical.

For awhile, following the decline in United States ex-vessel tuna prices, it was thought that ex-vessel albacore prices in Japan would fall below 110 yen per kilogram (US$277 a short ton). However, the brisk demand in Europe for albacore tuna is said to have stabilized the ex-vessel price for that species, which as of mid-December 1962 was reported to be selling for about 125 yen per kilogram ($315 a short ton). Reportedly, at that price, the Japanese canned tuna packers can still readily compete for the raw product.

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FIRST WINTER ALBACORE LANDING:

The first landing of Japanese winter albacore was reported at the Japanese tuna port of Yaizu on December 24, 1962. A total of 40 metric tons were landed. The fish, ranging in size from 11-22 pounds, were taken over a two-day period (December 19-20) about 120 miles off Choshi, Chiba Prefecture. Reportedly, winter albacore are usually taken farther north off Kinkazan, Miyagi Prefecture, and their appearance farther south this year is considered somewhat unusual.

The medium and large albacore sold ex-vessel for 125-150 yen per kilogram (US$315-378 a short ton) and the small albacore 106-110 yen per kilogram ($267-277). About half of the 40 tons were sold to canners. (Suisan Keizai Shimbun, December 27, 1962.)

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TUNA EX-VESSEL PRICES AT TOKYO:

The following ex-vessel prices were paid on December 10, 1962, for 390 metric tons of frozen tuna and other fish landed at the Tokyo Central Fish Market by two Japanese long-liners.

Table 1 - Tokyo Ex-Vessel Tuna Prices, December 10, 1962

Product	Price	
	Yen/Kg.	US$/Short Ton
Yellowfin (gilled & gutted):		
Extra lge., (over 120 lbs.)	110	277
Large (100-120 lbs.)	120-123	302-310
Medium (80-100 lbs.)	123	310
Small (20-80 lbs.)	120-123	302-310
Albacore	128	323
Fillets:		
Yellowfin	134.5-138	339-348
Big-eyed	138-141.3	348-356

The following ex-vessel prices were paid on December 25, 1962, for 240 metric tons of frozen tuna and other fish landed at the

Table 2 - Tokyo Ex-Vessel Tuna Prices, December 25, 1962

Product	Price	
	Yen/Kg.	US$/Short Ton
Yellowfin (gilled & gutted):		
Extra lge., (over 120 lbs.)	100	252
Large (100-120 lbs.)	106	267
Medium (80-100 lbs.)	106	267
Small (20-80 lbs.)	105	264
Albacore	128.6-131.5	324-332
Fillets:		
Yellowfin	118	297
Big-eyed	121	305

Japan (Contd.):

Tokyo Central Fish Market. (Suisan Keizai Shimbun, December 12 & 28, 1962, respectively.)

* * * * *

FROZEN TUNA MARKET FORECAST FOR EUROPE, 1963:

Japanese exports of frozen tuna to Europe for January-November 1962 totaled 43,195 metric tons, according to the Japanese periodical Suisan Tsushin, dated December 17. At that pace, 1962 Japanese frozen tuna exports to Europe were expected to total around 50,000 metric tons. This would represent an increase of 10,000 tons over 1961, when exports totaled 39,997 tons.

In 1963, Japanese frozen tuna exports to Europe are expected to increase further, possibly to 70,000 metric tons. This forecast is based on an anticipated increased demand for tuna in those European nations presently importing Japanese tuna, the opening of a new market in Spain following the removal of restrictions on Japanese exports of frozen tuna to that country, and on the likelihood that new markets may possibly develop in other countries, such as Belgium and the Netherlands.

The Japanese forecast of the 1963 European tuna market trends:

Italy: Japanese exports in 1960 totaled 22,000 tons; in 1961, 26,000 tons; and in 1962 will exceed 33,000 tons. Production facilities in Italy being expanded. Italian consumption of tuna increasing; market conditions relatively stable. Japanese 1963 exports of 37,000-40,000 metric tons fully within realm of possibility.

Yugoslavia: Japanese exports in 1961 totaled 9,400 tons. Declined somewhat in 1962 but expected to total around 8,000 tons. Canned tuna produced by Yugoslavia being exported to such countries as West Germany, where great market potential exists. Yugoslavia temporarily stopped purchasi .g frozen tuna from Japan but has again commenced buying, paying good prices. Exports in 1963 should range between 10,000-15,000 metric tons.

Czechoslovakia: Japanese exports in 1961 totaled 1,700 tons; in 1962 expected to total around 1,000 tons. Exports in 1963 expected to total from 1,000-1,500 tons, with emphasis on the exportation of lower-priced tuna, like big-eyed, which in December 1962 sold for $345 c.&f. Hamburg. Czechoslovakia said to be packing about half of tuna in cans and smoking remainder, but its canned tuna production expected to increase gradually.

France: The French Government, for the first time, issued an import license in 1962 authorizing importation of 3,500 tons of tuna, and expected to increase this amount in 1963 to 6,000 tons. Reportedly, the 1963 import license will be issued after May 1963 but may possibly be issued earlier. In terms of price, France is best market for Japanese frozen tuna. In this respect, great hopes held for France as market for Japanese-caught albacore.

Spain: Japanese exports to Las Palmas, Canary Islands, limited to 2,000 tons a year. Japanese exports to Spain proper limited to those originating from Japan proper, but no restrictions on amount. However, export regulations expected to be revised in 1963. Should transshipments to Spain proper be approved, exports to that country, including those to Las Palmas, expected to total 5,000 tons a year.

Tunisia, Libya, Ghana: Japanese exports to those African countries, which totaled 1,200 metric tons in 1961, increased to 1,700 tons in 1962, and expected to reach 2,000 tons in 1963.

In discussing 1963 frozen tuna trends, Suisan Tsushin further states that the four United States canneries located in Puerto Rico will be in full operation next year, and that for those four canneries and for the one United States tuna packing company located in Maryland, a total in the neighborhood of 100,000 short tons of raw tuna will be required. Reportedly, those five canneries will rely on United States and European fishing vessels to furnish as much of their raw tuna requirements as possible, but would have to depend on Japanese vessels to supply the greater portion of their needs.

Present production of tuna in the Atlantic Ocean is estimated at 80,000 metric tons by the periodical, which states that the Atlantic tuna production cannot possibly meet 1963 demand for tuna in the United States and in Europe, and adds that the shortage of raw tuna supply in 1963 will inevitably be greatly accelerated, if the decline in the Atlantic tuna catch should continue.

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RESTRICTIONS ON INDIAN OCEAN TUNA TRANSSHIPMENT PORTS REMOVED:

The Japanese Fisheries Agency, which, heretofore, had restricted transshipments of Indian Ocean-caught tuna to the ports of Penang (Malaya) and Singapore, has liberalized its transshipment policy. Henceforth, catches made in the Indian Ocean can be landed or transshipped from any port bordering the Indian Ocean. (Suisan Keizai Shimbun, December 25, 1962.)

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NEW TUNA VESSEL CONSTRUCTION:

At a press interview on December 25, 1962, the Japanese Fisheries Agency announced that it would permit the Japanese salmon fishermen engaged in the Japan Sea pink salmon fishery to construct a total of twelve 99-ton tuna vessels, but 15 salmon vessels must be retired from the salmon fishery for every 99-ton tuna vessel built. In addition, the Fisheries Agency, on December 27, reportedly was contemplating permitting the pink salmon fishermen to construct seven 85-ton trawlers, with ten salmon vessels to be retired for every trawler built, which would then mean that the present Japan Sea pink salmon fleet of 540 vessels would be reduced by 250 vessels to 290 vessels.

Also, at the December 25 press conference, the Fisheries Agency announced that it would permit eight 99-ton tuna vessels to be constructed under its policy of promoting the coastal fishery, and eleven 99-ton vessels to be constructed for assignment to the proposed Fiji Islands tuna base. The net effect of the Agency's action is that the new tuna vessel construction of 20,000 gross tons, which it authorized in August 1962, will be increased

Japan (Contd.):

by an additional 900 gross tons, or by the equivalent of nine 99-ton tuna vessels. (Suisan Keizai Shimbun, December 26 & 28, 1962.)

Editor's Note: Japanese tuna vessels between 40-99 gross tons are classified as medium-class tuna vessels. Those over 100 tons are classified as distant-water vessels. Both of those classes of vessels require fishing licenses, whereas tuna vessels under 39 gross tons do not. A press report January 1, 1963, indicated that in 1961, of a total of 1,300 tuna vessels over 40 tons gross, 409 vessels were in the 40-99 ton class. As for tuna vessels under 39 tons gross, a 1960 Government survey revealed that there were over 2,300 vessels in that category.

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TUNA LANDINGS BY MOTHERSHIP FROM SOUTH PACIFIC AREA, 1950-1960:

Landings by the Japanese mothership fleets fishing for tuna in the South Pacific increased from 6,479 metric tons (about 14.3 million pounds) in 1950 (when two mothership were first licensed to fish that area) to 24,002 tons (about 53 million pounds) in 1960. The landings have varied due to the number of mothership fleets and catcher vessels, the availability of the various species of tuna and knowledge of tuna fishing grounds.

Japanese South Pacific Mothership Tuna Fishery Landings, 1950-1960

Species	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950
	(Metric Tons)										
Tuna:											
Skipjack	60	78	42	42	15	28	15	11	28	18	11
Bluefin	595	6,596	4	5	5	6	618	7	7	2	2
Albacore	7,971	5,555	4,096	3,126	3,690	4,906	3,555	291	72	124	44
Big-eyed	1,710	1,364	1,911	1,854	1,496	768	1,199	748	539	2,433	523
Yellowfin	8,588	2,920	4,657	5,154	2,021	2,921	3,886	4,347	4,017	4,926	3,726
Swordfish & related species:											
Striped marlin	761	755	806	394	1,049	1,117	1,064	4	15	4	1
Broadbill	247	281	199	112	210	168	115	19	23	23	11
Black marlin	1,333	699	879	1,510	816	1,318	1,498	1,272	654	2,302	1,488
White marlin	202	114	115	147	122	263	542	145	236	43	25
Sailfish	1,839	193	209	246	147	232	134	174	78	59	20
Sharks	314	1,813	1,226	1,375	1,307	1,538	1,347	1,095	1,000	1,154	605
Other	382	320	241	142	302	297	148	19	43	76	22
Total	24,002	20,688	14,385	14,107	11,180	13,562	14,121	8,132	6,712	11,164	6,479

TUNA VESSEL TO BE EQUIPPED WITH BRINE TANK:

A Japanese fishing company is having a 300-ton tuna fishing vessel constructed in Shimizu, Skizuoka Prefecture, but unlike most Japanese tuna vessels (which are equipped with air-blast freezers) this vessel will be equipped with a 250-ton capacity brine tank. The vessel, the Akashi Maru, is scheduled to be completed in late February 1963. The vessel will be sent to the Atlantic Ocean in April. (Suisan Tsushin, December 19, 1962.)

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BOTTOMFISH FACTORYSHIP OPERATIONS IN BERING SEA, 1962:

In the 1962 season, Japan had 5 meal and 4 freezer factoryships in Bering Sea. Both were said to be unprofitable, and the meal vessels may not return to the Bering Sea for the summer of 1963.

Those for meal were mostly Antarctic whale ships of 8,000-14,000 gross tons, with a capacity of 500 metric tons of raw fish daily for reduction into meal and oil. The freezer capacity was 200 tons daily and the cold-storage capacity about 2,000-3,500 tons. Meal was transferred to supply vessels once or twice during the season, but frozen products were transferred every 10 or 15 days.

The five meal vessels were served by 10 or 12 pairs of trawlers and 4 or 5 single trawlers called "Hokkaido" boats. The pair trawlers were 100-150 gross tons with about 350 hp. engines. The Hokkaido trawlers were smaller, 60-80 tons, and underpowered with about 250-hp. engines. They took smaller catches.

The meal vessels received mostly flounders. Small flounders were frozen whole, larger sizes were dressed by removing heads and viscera before freezing. Plate freezers were used and frozen flounders were packed in 12-13-kilo (26.5-28.5 pounds) blocks. Since pair trawlers caught the most fish, the single trawlers did research for new grounds.

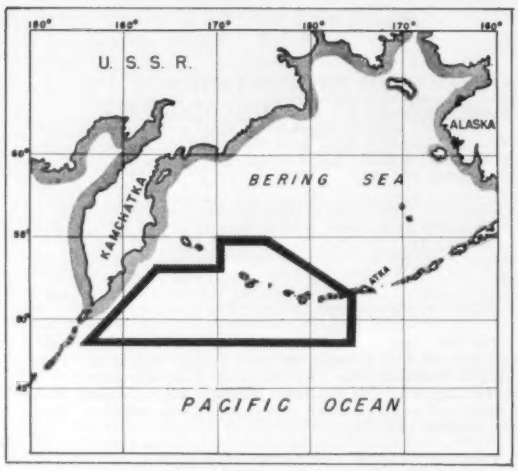
Formerly, 75 flounders of the smallest size filled a 13 kilo (28.5-pound) package. In the 1962 season it took 100-120, since the fish are getting smaller and thinner. Of four sizes of flounders, now only 10 percent of the catch was the largest size, while 30 percent was the smallest size. There were four kinds of flounders--yellow, golden, white, and asappa. Yellow flounders are cheapest and asappa are most expensive, but the latter made up only 2-3 percent of the catch. The white flounder grounds were found for the first time this year. Some "black halibut" or "oil flounder"--as designated by the Japanese--are caught and used for meal only.

Pair trawlers trawled out from the factoryship about two hours, after which one vessel took alongside the cod end. Then a new trawl was set and the vessels trawled back to the

Japan (Contd.):

ocean perch and poorest on flounders. Single trawlers had the opposite experience.

The production of one freezership was about 5,000 tons--divided as follows: 3,000 tons of flounders, 1,000 tons of shrimp, 500 tons of dressed fish, 300 tons of fillets of ocean perch, and 200 tons of miscellaneous fish.



The quota of the meal factoryships was about 100 tons of meal per day each. Their production was about 80 tons per day each. The four freezer factoryships (4,000-8,000 gross tons) were mostly Antarctic whale freezerships being used in the Bering Sea in the off-season. They could freeze 200 tons daily and had a cold-storage capacity of 4,500 tons. They transferred some frozen products to supply vessels during the 100-130 day season. The primary frozen products were shrimp and ocean perch. However, the cargo was completed with flounders, if necessary. The freezerships had 12 pairs of trawlers, which took 40-50 tons of shrimp or about the same amount of ocean perch daily. Some Alaskan pollock were taken with the ocean perch, but were discarded. The ocean perch season is early--in May and June on grounds north of Unimak Pass. Shrimp are caught in June and until July 15, northwest of the Pribilof Islands. In other areas they are caught all year round. The best quality shrimp are caught from May to August. After August they are spawning. Flounders were taken more toward Bristol Bay.

Most shrimp was frozen round, but some was beheaded by hand. Two or three freezerships had United States machinery for mechanically peeling shrimp. Ocean perch mostly were frozen dressed--heads off and gutted, using a German beheading machine. Two factoryships had German filleting machines. Single fillets were frozen skins on for export to the United States. In Japan the two single fillets were wrapped in cellophane for export to the United States. Fillets under 3½ ounces were retained in Japan. The average size of the fillets for the United States was about 4½ ounces each. The average 1.54-pound fish had a 38-percent yield and gave two fillets of about 4.7 ounces each.

The cod catch was small and kept mostly for the Japanese market. The head was removed and the fish slit down the back for a butterfly cod fillet. Some cod were machine filleted and frozen for the United States market, but quality and worms gave trouble.

Alaska pollock were used only for meal. They were discarded if taken on freezer vessels. Some long-liners with special licenses took halibut and sablefish west of Abstention Line and froze their catches. Some ocean perch had parasites and some cod had worms. Both were giving trouble in exports to the United States. Pair trawlers did best on shrimp and factoryship and hauled in the second cod end. The factoryship took the two cod ends aboard by crane. The round trip took about five hours. The catch of flounders varied from 2-25 metric tons. Single trawlers usually delivered once at night--possibly 5 to 10 tons. If fishing was good, they delivered twice daily.

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GOVERNMENT TO FINANCE SHRIMP BASE IN NORTH BORNEO:

The Japanese Overseas Economic Cooperative Fund (established by the Japanese Government in February 1960 with a capital of 5.2 billion yen--US$14.4 million--to promote development of Japanese enterprises in Southeast Asia) is reported to have decided to loan 30 million yen ($83,333) to a North Borneo fishery company. According to press reports, the company is a cooperative shrimp enterprise to be established in Sandakan, North Borneo, with Japan contributing 48 percent to the total capital of 70 million yen ($194,000) and North Borneo 52 percent. Two Japanese firms are participating in the venture.

The North Borneo company is expected to commence operations by April 1963. (Suisan Keizai Shimbun, December 28, 1962.)

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TESTS WITH POWER BLOCK ENCOURAGING:

From August-October 1962, a Japanese fishing company conducted experiments testing the efficiency of a United States-made power block in purse-seine fishing operations off northern Japan.

The Kenyo Maru (242 gross tons) operating from its base at Shiogama Harbor, was used in the test operations. The vessel was originally built for purse seining, but remodeled later for tuna long-line fishing and operated in that fishery for several years. In 1962 it was reconverted for purse-seine fishing at a cost of about 23.0 million yen (about US$64,000). The vessel was equipped with a power block, a topping winch, a vanging winch, a double hydraulic pump, and a remote control panel. The power block was fitted to a five-ton rolling boom nine meters (29.5 feet) high. All equipment was purchased from a United States company.

The vessel fished for 65 days on the Pacific Ocean side of Honshu Island during the three-month test period and make 38 seine sets which yielded a catch of 143.1 metric tons of fish, valued at about 9.9 million yen (US$27,500).

Japan (Contd.):

In conventional-type fishing, the Kenyo Maru would ordinarily carry 28 or more crew members to handle all equipment and fishing gear. By installation of the power block it was found that about 20 men could perform the same task. The number of men handling the net was reduced from 12 to 7, with two men each on the cork and lead lines, and three men handling the web. Compared with conventional methods of lifting the seine, the time was reduced one hour by use of the power block. There was no slippage of the net in the block during lifting operations which is a common occurrence with conventional equipment.

On several occasions the webbing parted during lifting operations. The Japanese fishing company states that studies are required to determine whether this was caused by: (1) lack of teamwork in handling the cork and the lead lines; (2) uneveness of lifting the net by the power block or; (3) whether the breaks were caused by loss in tensile strength of the webbing after water shrinkage.

Discounting those problems and the small catch, it is reported that the firm considers the trial test of the power block most satisfactory. (Fisheries Attache, United States Embassy, Tokyo, November 12, 1962.)

Note: See Commercial Fisheries Review, November 1962 p. 74.

Jordan

INCREASE IN LANDINGS OF FISH EXPECTED:

The commercial fish catch by Jordan has increased from about 99 metric tons in 1957 to 138 tons in 1961.

The Jordan Fisheries Company presently makes almost all of the purchases of fish from fishermen at Aqaba and distributes the fish through its storage space in Aqaba and its one wholesale distributing center in Amman to about 20 fish distributors throughout Jordan. The company is capitalized at Dinar 100,000 (US$280,000), of which the Government share is Dinar 15,757 (US$44,000). The company has made only marginal profits or incurred losses since its establishment in 1955, except in 1961 when for the first time an 8-percent dividend was declared.

The Fisheries Company officials hope to expand production within the next few years to about 600 tons by 1967. The Company owns refrigerated space in Aqaba with a capacity of about 250 tons, of which three quarters is rented out to importers of meat, cheese, and other perishable foodstuffs. Expansion of the refrigerated space devoted to fish could thus easily accommodate the expected increased fish catch.

Two developments are favoring the trend toward increasing Jordan's catch of fish. The Government early in July 1962 issued a temporary ban on fresh fish imports. Imports of fresh fish during 1961 amounted to 554 tons while domestic production was only 138 tons. Since the domestic catch can not hope to match the domestic consumption needs at present, this ban will probably have to be modified soon, according to company officials, in favor of a system to grant import licenses to fish distributors in proportion to their purchases of local fish. The reported agreement with Saudi Arabia to allow Jordanian fishermen to fish in Saudi territorial waters is significant, if implemented, since the area farther down in the Gulf of Aqaba and in the Red Sea is reputed to be rich in fish. There has been a proposal for Germany to supply one to three modern fishing vessels to fish those rich areas, but the proposal is believed to be still in an embryonic stage.

Company officials point to a marketing obstacle which will have to be overcome if fish

Jordan (Contd.):

sales are to be substantially increased. The fish caught near Aqaba generally weigh at least 3 kilograms (about 6.6 pounds). Many fish consumers can afford to buy only small whole fish, and are used to buying whole fish so that offers of fillets or parts of fish are often unacceptable. Company officials believe that good marketing techniques combined with selling only fresh fish will overcome that obstacle. (United States Embassy, Amman, November 12, 1962.)

Republic of Korea

FISHERIES LITERATURE NEEDED BY LIBRARIES:

A resolution requesting assistance for the libraries of the Central Fisheries Experiment Station and the Pusan Fisheries College, both in Pusan, Korea, was passed at the Tenth Session of the Indo-Pacific Fisheries Council held in Seoul, Korea, October 10-25, 1962. Fisheries literature is lacking in both those libraries. Anyone able to donate unneeded papers, duplicates, or gift subscriptions to journals and other periodicals will perform a service for the fishery biologists, gear experts, and technologists of Korea.

Note: Material can be sent direct to the libraries; or appropriately marked material will be forwarded to Korea if sent to the U. S. Bureau of Commercial Fisheries Biological Laboratory, P. O. Box 3830, Honolulu 12, Hawaii.

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DEVELOPMENT OF FROZEN SHRIMP EXPORT INDUSTRY:

Korea's frozen shrimp exports were expected to earn US$1.5 million in foreign exchange in 1962, with double that amount anticipated in 1963. The development of Korea's frozen shrimp export industry is an example of teamwork in technical assistance.

In 1956, a United States Operations Mission under the United States foreign aid program established a fisheries program in Korea. At that time there was no knowledge of a commercial shrimp resource in Korean waters. Several individuals had tried without success to prepare frozen shrimp for export using raw material taken incidentally to other fisheries.

The catching of shrimp with other fish suggested concentrations of shrimp large enough to support a fishery. Gulf of Mexico shrimp trawl nets were brought to Korea for exploratory work. A vessel belonging to the Korean Government's Central Fisheries Experiment Station in Pusan was equipped to operate otter-trawl gear. The vessel's crew was trained in the use of the gear and a program of exploratory fishing for shrimp was begun under the supervision of the United States Fishery Operations Advisor. When the early work strongly indicated the presence of shrimp in commercial quantities, the exploratory effort was speeded up by using several commercial fishing vessels owned by interested fishermen.

The processing and marketing of Korean frozen shrimp was begun under the guidance of the United States Processing and Marketing Advisor. With the help of United States development funds, a demonstration shrimp-processing plant was set up at the Korean Fisheries Experiment Station. Regulations setting up quality standards for frozen shrimp (as well as processing plant standards) were prepared. The assistance of the United States Eighth Army Veterinary Corps was obtained in evaluating the product and the facility and certifying both as meeting military procurement requirements. Personnel of the Korean fishery products inspection service were given training to qualify them to enforce the new shrimp quality standards. The demonstration shrimp plant was then made available to the Korean fishing industry and used to train supervisory and operating personnel.

Korean frozen shrimp was first sold to the United States Army near the end of 1958. Because of the limited production capacity of the pioneer vessels and the experience that would be gained by processing under the United States Army Veterinary Corps inspection, those wishing to enter the new industry were encouraged to qualify as shrimp processors for the United States Army before attempting to negotiate with foreign buyers.

By mid-1960, the quality of Korean shrimp and the ability of Korean processors to prepare a highly acceptable product had been sufficiently demonstrated to arouse the interest of foreign traders doing import-export business in Korea. Trial shipments were again undertaken and favorable acceptance abroad led to a steadily increasing demand. The number of vessels licensed to operate shrimp

Republic of Korea (Contd.):

trawl gear along the eastern coast of Korea has been increased to 25 and the catching of shrimp by traditional gear is also increasing. There now are eight Korean processing plants qualified to prepare frozen shrimp for export. The eight plants have created at least 1,500 new jobs principally for young women who are required in the preparing and packing operations.

The processors involved and the industry in general have become aware of the export potential of fishery products and are working to develop other items for export. The value of exports of marine products during 1962 is expected to approach $10 million as compared to less than $3 million in 1956. (United States Embassy, Seoul, January 7, 1963.)

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LANDINGS OF MARINE PRODUCTS, 1951-1961, AND SIZE OF FISHING FLEET, 1954-1961:

South Korea's landings of marine products in 1961 were 28.7 percent above those in 1960 and 64.2 percent above landings in 1951. Shellfish landings showed a marked increase in 1961.

Table 1 - South Korean Landings of Marine Products, 1951-1961

Year	Fish	Shellfish	Seaweed	Other	Total
	(Metric Tons)				
1961	245,419	43,199	36,989	109,011	434,618
1960	237,226	13,481	27,437	59,640	337,784
1959	266,181	12,661	29,683	73,601	382,126
1958	291,191	15,884	28,759	59,359	395,193
1957	279,767	12,187	34,797	76,406	403,157
1956	257,515	9,778	24,423	49,200	340,916
1955	190,424	6,799	20,019	41,992	259,234
1954	188,941	10,455	17,253	32,887	249,536
1953	185,185	8,433	17,516	46,902	258,036
1952	208,123	9,557	13,199	46,739	277,618
1951	187,474	9,211	19,320	48,632	264,637

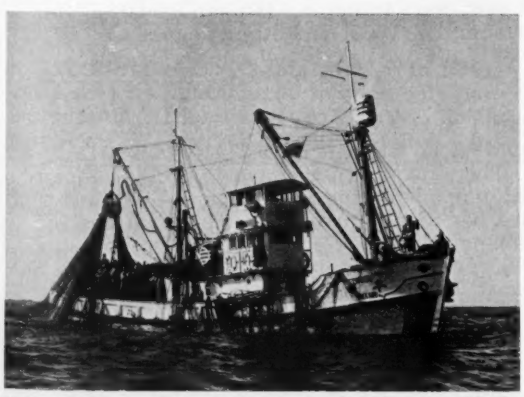


Fig. 1 - A Korean mackerel seiner equipped with a power block for hauling in the net.

Fig. 2 - Large seine nets used for mackerel fishing.

The number of mechanized vessels in South Korea's fishing fleet and the total tonnage of the mechanized fleet increased each year between 1954 and 1961. South Korea's sail-powered fishing fleet was cut back sharply in 1955, but in recent years the sail fleet has shown a small increase in both number of vessels and total tonnage. (Monthy Economic Review, Korean Reconstruction Bank, July 1962.)

Table 2 - Size of South Korean Fishing Fleet, 1954-1961

Year	Mechanized Vessels		Sail-Powered Vessels	
	Number	Total Tonnage[1/]	Number	Total Tonnage[1/]
1961	6,803	89,620	2,114	23,257
1960	5,966	80,927	2,036	22,420
1959	5,394	73,074	1,915	21,573
1958	5,050	68,116	1,717	20,913
1957	4,389	58,117	1,694	21,394
1956	4,126	54,185	1,686	21,508
1955	3,804	50,004	1,605	20,472
1954	3,667	47,637	2,676	32,689

1/Metric tons.

* * * * *

PRODUCTION STATUS OF NEW AGAR-AGAR PLANTS:

The construction of a new agar-agar plant in Pusan was approved under the former U.S. International Cooperation Agency (now Agency for International Development or AID) on February 9, 1956, for US$335,000 plus the use of $906,992 of counterpart funds (for industrial machinery and motors including extraction tanks, ice-making machinery, pumps, etc.).

Republic of Korea (Contd.):

The objectives of the plant were the production of one million pounds of chemically pure agar-agar annually, with a minimum value of about $1.50 a pound in the export market; 2 million pounds of high-strength seaweed gelatin; and to aid the economy of Korea. As of June 30, 1962, the buildings were 95 percent completed and equipment 100 percent installed, with completion scheduled in September 1962. Initial operations were withheld pending the installation of additional equipment provided under a fiscal year 1957 project. This project was beset by various problems which resulted in the establishment of a subproject involving an additional US$120,000 plus counterpart funds of $97,492 (Typhoon Relief Fund), and $269,230 (Utilization Loan).

The additional equipment, purchased in April 1960, was delivered by February 1961 and at the end of June 1962, 20 percent had been installed. The remaining 80 percent has been released from customs and was being warehoused at the plant site in Pusan.

This Pusan plant as of August 1962 was being intermittently operated with the equipment already installed, producing about 5 metric tons of crude agar-agar paste per day. Approximately 110,000 pounds of crude agar-agar paste valued at about $60,000 has been exported to Hong Kong.

The more than usual delays encountered have been due to the sponsor's desire to establish a truly modern production facility based on Japanese patents and equipment from a licensed manufacturer. The remaining problem was that of technical advice to be given by a Japanese engineer expected in August 1962 to supervise the installation of equipment and later the trial operation.

Another new agar-agar plant at Suchon designed to produce 200,000 pounds of agar-agar annually was scheduled to be in operation in September 1962 but financing troubles were expected to delay the opening of that plant.

A third modern agar-agar plant located in Pusan, scheduled to produce 240,000 pounds a year of gelatinous agar-agar has been in operation and was expected to have export earnings of $450,000 in 1962. The sponsors of this plant also have plants in Mokpo and Ulsan. (United States Embassy, Seoul, August 31, 1962.)

Malaya

CANNED TUNA IN BRINE EXPORTS TO U. S.:

The Malayan Marine Industries (a tuna packing company located in Penang and jointly operated by Japanese and Malayan interests) started packing tuna in brine in late 1962 and is reported to have exported a small quantity of its product to the United States. Pending a report on the acceptability of this trial shipment, the company plans to fix a price on future exports to the United States.

M/V Shoyo Maru, a research vessel of the Japanese Fisheries Agency visited Penang early in 1962 before going on to search for tuna near Mauritius.

The Malayan plant initially began operations in February 1960, packing canned tuna in oil for the European market. In December 1961, the Japanese Government allotted to that company a production quota of 36,000 cases of tuna in brine for export to the United States, but it was not until November 1962, according to press reports, that the plant began to pack tuna in brine. (Suisan Tsushin, December 25, 1962, and other sources.)

* * * * *

JOINT MALAYAN-JAPANESE TUNA COMPANY RECEIVES FINANCIAL AID:

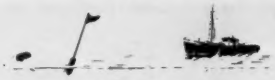
The Japanese Overseas Fishing Company which operates the joint Japanese-Malayan tuna packing company (began operations in Penang, Malaya, February 1960) reportedly will receive financial assistance from the National Federation of Japanese Tuna Fishery Cooperative Associations (NIKKATSUREN). The cooperative, at its director's meeting held on December 5-6, 1962, voted to secure a loan from the Agriculture and Forestry Central Cooperative Bank, which it would advance

Malaya (Contd.):

to the Overseas Fishing Company to provide a continuous operating fund (to be used for purchase of tuna landed at Penang) of 300 million yen (US$833,000) per month for its Malayan enterprise.

The Malayan enterprise hopes to purchase, on an average, 1,900 short tons of tuna each month from five clipper vessels and 16 ice boats that are expected to unload their catches at Penang. Of that amount, the company plans to ship approximately 800 tons back to Japan. A 1,000-ton-capacity cold-storage plant and a cannery with a daily production capacity of 500 cases of canned tuna are being constructed at Penang for the Malayan firm, according to Suisan Tsushin, December 8, 1962.)

Editor's Note: The Malayan joint firm originally was authorized to pack only canned tuna in oil for export to Europe. In December 1961, the Japanese Fisheries Agency authorized that company to annually export to the United States 36,000 cases of canned tuna in brine. However, due to the unprofitable nature of the operation, the Malayan cannery temporarily suspended packing tuna in brine until November 1962. In April 1962, the Fisheries Agency authorized the Overseas Company to land 6,000 short tons of fresh tuna at Penang for freezing and transshipment to the United States. At the same time, the Agency designated both Penang and Singapore as transshipment ports and authorized a combined frozen tuna transshipment quota of 4,000 tons for those two ports.



Mexico

DIRECT TAXES ON FROZEN SHRIMP EXPORTS:

The present Mexican Federal and Municipal direct taxes on frozen shrimp exports result in approximately the following charges:

From all east coast points and the west coast points of Salina Cruz in Oaxaca and Santa Rosalia in Baja California:

	U.S. Cents Per Lb.
Federal taxes:	
Export, specific	0.09
Export, ad valorem . .	3.32
Severance	1.11
Municipal tax	0.07
Total Federal and Municipal taxes . .	4.59

From other Mexican west coast points the Federal export ad valorem tax is about 3.55 U.S. cents per pound and other taxes are the same as shown above, resulting in a total tax of about 4.82 U.S. cents per pound.

The Mexican State of Campeche levies a separate and additional tax on shrimp exports of 2.21 U.S. cents per pound, so combined Mexican taxes on frozen shrimp exports from that State amount to about 6.80 U.S. cents per pound. (United States Embassy, Mexico City, December 20, 1962.)

Note: In computing approximate tax rates, the following factors were used: 12.50 Mexican pesos equal US$1; one metric ton equals 2,200 pounds.

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SOVIET FISHING VESSELS ATTACHED TO THE CUBAN FLEET ENTER MEXICAN PORT FOR SUPPLIES:

Early in December 1962 two Soviet fishing vessels, the Obdorski and the Omar, both displacing slightly over 500 tons and both attached to the Cuban fishing fleet (Flota de Cuba), arrived at the Mexican port of Veracruz after requesting permission to enter the port to obtain water and food. Russian crew members of the two vessels said they had no idea why the vessels came to Mexico instead of Havana, which was their destina-

Mexico (Contd.):

tion. The vessels remained in port for several days and then proceeded out to sea again.

A conservative daily newspaper carried an editorial commenting on this evidence of Soviet participation in the Cuban fishing fleet and expressing concern that the Soviet fishermen, with their more advanced fishing techniques, could contribute to the loss to Mexico of the great wealth represented by marine life in Mexican waters. (United States Embassy, Mexico City, December 12, 1962.)

Morocco

EXPORTS OF SARDINES TO FRANCE MAY BE RESTRICTED:

A French commercial delegation came to Morocco on December 3, 1962, to discuss the status of certain French quotas (including sardines) which apply to Moroccan exports to France. The French delegation included officials of the Ministry of Finance, the Ministry of Agriculture, the Merchant Marine, and representatives from the French Embassy at Rabat.

According to the press, France during the summer months will restrict or stop, if necessary, Moroccan exports of sardines if the sardine catch in France is a good one. This agreement was made apparently to avoid any incident such as occurred during the summer of 1962 when the French sardine fishermen actively intervened to block imports of sardines from Morocco. (United States Embassy, Rabat, December 14, 1962.)

Nicaragua

FISHING LICENSES GRANTED TWO CARIBBEAN COAST COMPANIES:

The Government of Nicaragua has granted fishing licenses to two firms to operate commercial fishing enterprises from Caribbean coastal ports.

A commercial fishing license was granted to one Nicaraguan firm to fish for shrimp, spiny lobster, crab, oysters, clams, mackerel, tuna, sardines, corbina, and miscellaneous fish for bait. Specifically excluded are turtles. The license is granted for 10 years on condition that the firm comply with the various regulations set forth in the General Law on the Exploitation of Natural Resources and the Special Law on the Exploitation of Fish and Shellfish. The firm is required to begin operation of its plant in Puerto Cabezas within 90 days of the date of the decree (Decree No. 15-DRN, published in La Gaceta No. 216 of September 22, 1962). The firm's production is expected to be primarily for export.

A second license was granted to another firm for five years to fish for all types of fish and shellfish except turtles. Compliance with the two laws and regulations mentioned above is required. The firm was given 45 days from the date of the decree (Decree No. 17-DRN, published in La Gaceta No. 264 of November 19, 1962) to get the plant on Corn Island into operation. This plant will also produce for export and it is expected to concentrate on the spiny lobster fishery.

Norway

EXPORTS OF CANNED FISH, JANUARY 1-SEPTEMBER 22, 1962:

Norway's total exports of canned fish during the period January 1-September 22, 1962, were 19.8 percent greater than in the same period of 1961. All of Norway's important canned fish products, except soft herring roe and shellfish, were exported in greater quantity in 1962. Exports of

Norway (Contd.):

canned smoked brisling were up 39.8 percent and exports of canned smoked small sild were up 24.2 percent.

Norwegian Exports of Canned Fish, January 1-September 22, 1962 1/

Product	1962	1961
	. . (Metric Tons) . .	
Smoked brisling	4,419	3,160
Smoked small sild	10,255	8,258
Kippered herring	3,143	2,673
Soft herring roe	682	709
Sild delicatessen	355	218
Other canned fish	2,397	2,496
Shellfish	1,359	1,364
Total	22,610	18,878

1/Preliminary.

During January-August 1962, Norway's total exports of canned fish showed an increase of 17.3 percent in quantity and 21.9 percent in value over exports in the same period of 1961, due mainly to an increase in exports to the United States and the United Kingdom. There was a sharp decline in exports to South Africa.

Norway's Total Exports of Canned Fish, January-August 1961-62 1/

Year	Quantity	Value	
	Metric Tons	Million N. Kr.	Million US$
1962	19,786	100.2	14.0
1961	16,863	82.2	11.5

1/Preliminary.

The United States was the leading buyer of Norwegian canned fish during January-August 1962, taking 46.1 percent of total exports or 9,122 metric tons valued at N. kroner 46.8 million (US$6.5 million) as compared with 6,677 tons valued at N. kroner 35.6 million (US$5.0 million) during the same period of 1961. Other important markets for Norwegian canned fish in 1962 were the United Kingdom, Australia, Canada, East Germany, and South Africa.

At the end of the brisling canning season on October 15, 1962, the brisling pack equaled 414,818 standard cases (100 3 3/4-oz. cans), as compared with the 1961 pack of 424,577 standard cases. The small sild pack between May 1-October 20, 1962, amounted to 391,956 cases, as compared with 394,248 cases in the corresponding season in 1961. Canners were disappointed by the catch and supply of small sardines for sild packing in the fall of 1962. The supply of mackerel for canning up to October 13, 1962, was reported as 2,062 tons as compared with 606 tons in the same period of 1961. As usual there was some canning of crab and shrimp in the fall of 1962, but pack data are not yet available (Norwegian Canners Export Journal, November 1962).

* * * * *

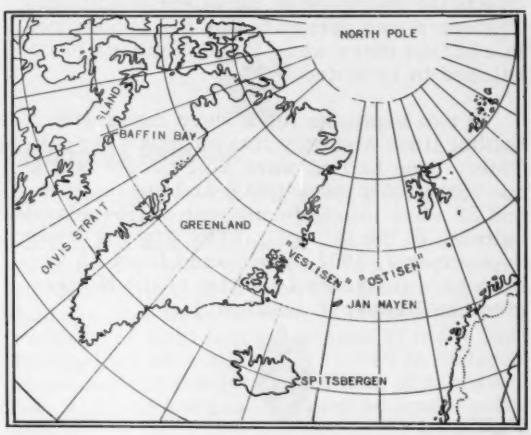
FISHERIES RESEARCH VESSEL EXPLORES WATERS OFF WEST GREENLAND:

In April and May of 1962, the Norwegian research vessel G. O. Sars made a cruise (April 9-May 16, 1962) off the coast of western Greenland to study cod and halibut. The results of that cruise are to be compared with a similar trip made in April 1959.

Norwegian research vessel G. O. Sars.

The investigation itself began at Noname Bank on April 19 and ended off Vestmannaeyar, Iceland, on May 13.

Off Iceland, the research vessel took part in an international sampling project with trawls, started on the initiative of the International Council for the Exploration of the Sea (ICES).



The ice conditions off western Greenland were mainly normal. Broken ice and occasionally pack ice were encountered over the entire Julianehaps Bay and Nanortalik Banks so it was not possible to fish there at the start of the season. At the Holsteinsborg Deep, some drift ice was encountered but it did not hinder fishing.

Hydrographic and fishing stations were occupied off Greenland's west coast in the general areas of Noname Bank, Fylla Banks, and Sukkertoppen. The surface water temperature was somewhat lower than at the

Norway (Contd.):

same time in 1961, in the intermediate and lower depths about the same as in 1961.

The relatively low temperature of the surface water was probably not the result of a stronger flow of arctic water, but apparently the direct result of ice and the stable weather conditions.

Ten fishing stations were made with cod lines and the catch of cod was consistently over average.

In the Holsteinborg Deep and along the western edge of the Little Hellefisk Bank, cod fishing was very good and samples were taken of 1,174 cod. In addition, 1,796 were measured.

The size varied somewhat between the different catches, but the majority were suitable for salting.

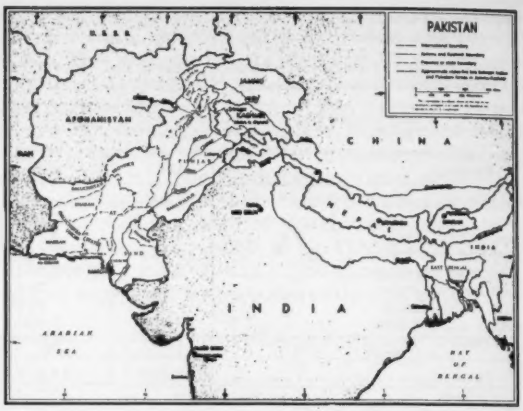
All the cod were in excellent condition. The catch was dominated by the 1953 brood. In addition there were large numbers of cod hatched in 1956 and 1957.

At two locations tests were made with halibut lines and only five halibut were caught. Thirty-nine halibut were also caught on the cod lines. All were small and not mature and 32 were marked--all with yellow plastic buttons, in the left gill. (The Fishing News, September 7, 1962, abstracted from an article by a fisheries scientist of the Norwegian Sea Research Institute.)

Pakistan

FISH HARBOR ON BAY OF BENGAL TO BE BUILT:

Construction of a fish harbor on the Bay of Bengal will be started by the Government of Pakistan sometime after July 1963. The harbor, costing Rs.106 million (US$22 million) will be located at Chaktai, a small town on the Karnaphuli River near Chittagong. The development of what seem to be rich fisheries in the Bay of Bengal should be greatly aided by a modern fish harbor. Private capital in Pakistan has shown an interest in buying the mechanized vessels and modern gear needed to make the new harbor



worthwhile. (United States Embassy, Karachi, January 5, 1963.)

In 1962, both the Government of Pakistan and private fishery firms in Pakistan invited United States firms and investors to participate in various joint United States-Pakistani commercial fishing ventures.

Peru

FISH MEAL MARKETING PROCEDURES:

The Consorcio Pesquero del Peru S. A., was not given legal control over all Peruvian fish meal exports by Peruvian Decree-Law No. 14228, as was previously indicated. Decree-Law No. 14228 was advisory rather than mandatory in character, according to the latest report on its interpretation.

The Consorcio Pesquero del Peru S.A., (Fisheries Consortium of Peru) is the marketing agency for a large percentage of Peru's fish meal production. The marketing system described in Decree-Law No. 14228 would give the Consortium complete control over all Peruvian fish meal exports if adopted, but opposition may prevent its adoption.

It has been reported that the Consortium is naming sole importers in Belgium, in the Netherlands, and in West Germany to receive Consortium fish meal shipments to those countries. It is not clear at present how the Consortium plans to handle sales to the United States. One report indicates that the Consortium will name less than seven importers

Peru (Contd.):

in the United States. (United States Embassy, Lima, December 10, 1962.)

Note: See Commercial Fisheries Review, December 1962 p. 83.

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FISHERIES TRENDS, THIRD QUARTER 1962:

Peruvian fish meal exports in January-September 1962 amounted to 802,000 metric tons, up 46.3 percent from exports of 548,158 tons in the same period of 1961, and 94,000 tons more than were exported in the entire year 1961. Peruvian fish meal production in the first nine months of 1962 amounted to 727,285 tons, according to preliminary data from the International Association of Fish Meal Manufacturers. A representative of the Peruvian fish meal industry estimated that fish meal production in Peru had increased 37 percent in the 12-month period ending August 31, 1962. He thought that the industry would grow at the same rate for another 12 months, after which production would level off.

Callao--one of Peru's principal fishing ports.

Peruvian fish oil exports in 1962 were expected to reach 125,000 metric tons, which would be an increase of 22.1 percent over exports of 102,306 tons in 1961. A value of US$11.3 million is forecast for the estimated 1962 fish oil exports, which would be an increase of only 4.6 percent over the $10.8 million received for 1961 fish oil exports. The price of Peruvian fish oil for export, which averaged $106 per ton (4.8 U. S. cents a pound) in 1961, is expected to average only $90 per ton (4.1 cents a pound) in 1962.

It appeared that the value of Peru's exports of all fishery products in 1962 will reach $127 million, which would be nearly $56 million more than the total value of fishery exports in 1961. Greater exports of fish meal at better prices are the main reason for the estimated increase in value. The profitable fish meal industry has attracted great interest on the part of investors and created a demand for new plants. New simplified procedures for the issuance of licenses for fish meal plants were established by the Government in August (Supreme Decree No. 11 published in El Peruana, Aug. 29, 1962). In the past it usually took several months to obtain a license even under the best of conditions, but under the new system licenses may be issued within a week after application. The average cost of installing and starting a fish meal plant in Peru was estimated recently at $1 million. The fishing industry appears to have been a major contributor to the Peruvian economy in the third quarter of 1962. Sales of machinery and equipment to the fishing industry expanded when most other sales dropped off. (United States Embassy, Lima, November 9, 1962.)

Philippine Republic

IMPROVEMENT OF FISHING INDUSTRY STRESSED BY PRESIDENT:

For the second time in recent weeks the President of the Philippines has stressed his determination to improve the fishing industry. In a December 6, 1962, speech in Palawan he said that he intends to make the Philippines self-sufficient in fish in order to eliminate the costly importation of canned fish which in 1961 was valued at US$16 million.

The Emergency Employment Administrator has announced a P15 million (about US$3.9 million at free rate of exchange) fishery development project beginning December 14, 1962. The project will establish a network of 16 fishing ports, refrigeration stations, fish farms and nurseries in appropriate coastal provinces. Also on December 14, the President was scheduled to turn over Pier 14 in the Manila North Harbor area for the exclusive use of the fishing industry.

In other fishing developments, the Fisheries Director stated that a Norwegian expert was scheduled to arrive in January 1963

Philippine Republic (Contd.):

on loan from the United Nations Foods and Agriculture Organization (FAO) to assist in the development of a purse-seine fishery. He also said that a deep-sea fishing institute, a joint project of the Philippine Government and the FAO, would be opened by mid-1963.

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U. S. FRESHWATER FISH BIOLOGIST ACCEPTS FAO ASSIGNMENT:

A fresh-water fish biologist from the United States (Smithville, Tenn.) has been assigned to a technical assistance project in the Philippines by the Food and Agriculture Organization. The appointment is for 12 months.

The biologist, who was due to arrive in Manila on November 28, 1962, will assist the Philippine Government in operating the Freshwater Fisheries Investigations Unit, especially on work being done at Laguna de Bay. He will also advise the Government on the best ways of carrying out inland fishery surveys and research.

Until his present FAO assignment, he was a fisheries research biologist with the U. S. Fish and Wildlife Service at Stuttgart, Ark. He also has acted as district biologist for the Tennessee Game and Fish Commission and as a fisheries management biologist with the U. S. Fish and Wildlife Service at Atlanta, Ga.

Poland

LANDINGS OF MARINE PRODUCTS AND SIZE OF FISHING FLEET, 1961:

In 1961, Poland's fleet of sea fishing vessels gained 1 factory trawler, 2 trawlers, and 6 cutters, but there was a decline in the number of vessels classified as "luggers and trawlers." The gross registered tonnage of the fishing fleet in 1961 was 4.7 percent greater than in 1960.

Table 1 - Poland's Fleet of Fishing Vessels, 1950, 1955, and 1960-1961

Type of Vessel	1961	1960	1955	1950
	(Number of Vessels)			
Factory trawlers	2	1	-	-
Super trawlers	53	53	8	-
Trawlers	15	13	20	24
Luggers and trawlers	46	50	34	-
Luggers	3	3	3	3
Cutters	538	532	397	338
Auxiliary vessels	3	3	2	-
Total	660	655	464	365
Total Gross Registered Tons	91,700	87,600	43,200	18,200

Marine landings by Poland's fishing fleet in 1961 were only about one percent greater than in 1960. An increase in landings of sprats and unclassified fish was almost offset by a decline in groundfish landings.

A Polish fish processing plant in Gdynia. Preparing herring for hot smoking.

Poland (Contd.):

Table 2 - Poland's Marine Landings of Fishery Products, 1950, 1955, and 1960-1961

Fishery	1961	1960	1955	1950
	(Metric Tons)			
Groundfish	41,100	51,100	40,300	48,200
Herring	93,600	93,600	52,000	9,500
Sprats	11,300	9,900	5,100	1,200
Other	23,400	13,400	9,700	7,300
Total	169,400	168,000	107,100	66,200

Marine landings in 1961 were up 155.9 percent from those in 1950, due mainly to an almost tenfold increase in herring landings. The increase in landings reflects the rapid expansion of the Polish fishing fleet. (Concise Statistical Yearbook of the Polish People's Republic, 1962.)

Note: See Commercial Fisheries Review, November 1961 p. 63.

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LONG-RANGE FISHERY PLANS CALL FOR WIDE-RANGING FLEET OF VESSELS:

Plans for expanding Poland's fishing potential and using foreign bases or ports, especially in West Africa, in order to expand fishing operations in South Atlantic waters, were discussed in an article published by Tygodnik Gdanski.

Poland's long-term plans for the development of the fishing industry in the years 1961-1980 call for a fish consumption of 11.5 kilograms (about 25.3 pounds) per capita. The realization of this goal (plus exports of 80,000 metric tons of fish and the production of 65,000 tons of fish meal per year) will require landings amounting to 900,000 tons in the year 1980.

In order to achieve this goal it is planned to develop fishing by factoryship trawlers and refrigerated trawlers, as well as to expand the fleet for expeditional purposes basing on specialized motherships. The North Atlantic, the most productive fishing ground, is envisaged as the fishing area of the deep-sea fleet.

At present the Polish fishing fleet exploits the Northwest Atlantic fishing grounds by means of factoryships. However, consideration should be given to the possibility that the dynamic development of world fishing carried on in the Northwest Atlantic can create a situation in which those rich fishing grounds will fail to provide good catches for Polish vessels.

The article points out that Poland should not either rely too much on temporary good fishing in the Greenland area, but should look for new fishing areas for her present and future fleet. In the light of development prospects of the fleet, and considering the fact that the range of a factoryship trawler based in Poland, amounts to 4,500 miles, of special interest to Poland should be the region along the northwest and central Africa starting at Cap Blanco, to the Gulf of Guinea. The exploitation of fishing grounds rich in fish off Angola, the grounds near South Africa, the Caribbean Sea, the Brazilian Shelf, and the rich fishing grounds near the Falkland Islands off the coast of South America will be feasible if the vessels are based at foreign ports or if motherships are used.

The essential task of the fishing fleet, the article continues, is to provide the Polish population with a sufficient amount of fish. But it is possible, especially during the period of finding new fishing areas outside the home-port range of the Polish fleet, situations can arise when part of the catch will be sold in countries with which Polish fishing enterprises cooperate. Such cooperation, for example, was started with Guinea in 1961.

Another cooperative venture began with the signing of an agreement between Poland and Nigeria for deliveries of fish to Lagos, Nigeria. In implementing this agreement two trawlers, the Neptun and the Mamry have set sail for African waters. Besides the profits from the sale of fish from the first fishing expedition, of considerable importance to Poland is furthering of economic cooperation with Nigeria. The high-quality fish unloaded in a foreign port will demonstrate the efficiency of Polish fishing vessels. Therefore, it may be expected that the new African countries will soon become the important customers of Polish shipyards.

South Africa Republic

LEGISLATION TO EXTEND TERRITORIAL WATERS PROPOSED:

In a statement released on December 21, 1962, the South African Prime Minister announced that the Government proposes to introduce legislation to extend the limit of the territorial waters of South Africa and South-

South Africa Republic (Contd.):

West Africa to 6 nautical miles from baseline, and the fishing limit to 12 nautical miles from baseline.

He stated that the effect of the legislation will be to apply the 6 plus 6 formula which narrowly failed of adoption at the 1960 Law of the Sea Conference, and which the Government is satisfied commands the widest measure of international acceptance. With respect to the continuation of fishing rights in the outer 6 miles, it is believed that in South African and South-West African coastal waters no problems of any significance will arise. According to the Prime Minister, the Government is prepared to consider sympathetically representations of any state which might consider its interests affected by the new legislation.

If international agreement on the breadth of territorial waters is reached after legislation is enacted, South Africa would consider amending the legislation to bring it into line with whatever had been internationally agreed upon. The Prime Minister also announced the Government's intention to accede to four 1958 International Conventions on the Law of the Sea: Territorial Sea and the Contiguous Zone; the Continental Shelf; the Conservation of the Living Resources of the High Seas; and the High Seas. (United States Embassy, Pretoria, December 22, 1962.)

Switzerland

FISH-SCALING MACHINE DEVELOPED:

A Swiss manufacturer has developed a device called the "Roto-Fix," which is used for scaling fish. The machine is in the form of a rotary scraper and a flexible shaft, driven at high speed by an electrical motor. Working cleanly and quickly without danger for the operator, the Roto-Fix device is expected to render a service in restaurants, hotels, and other large catering establishments. (United States Embassy, Bern, December 14, 1962.)

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WATCH FOR DIVERS:

A watch factory at Chaux-de-Fonds, Switzerland, has created a new watch of a special type for the use of underwater divers. The watch is known as the "Vulcain Cricket Nautical." Equipped with a clock-striking mechanism and a decompression table, this diver's watch can play a double role under the water by reminding the diver when it is time to start for the surface and enabling him to see at a glance the various times and depths at which he will have to pause in order to avoid faulty decompression.

The clock-striking mechanism allows two divers to signal each other acoustically considerably beyond their range of vision. In tests the watch has stood up to pressures equivalent to depths of approximately 1,000 feet. (United States Embassy, Bern, December 14, 1962.)

U.S.S.R.

LANDINGS OF FISHERY PRODUCTS SURPASS GOAL IN 1962:

The Soviet Union's annual plan for fishery landings (including whales and other mammals) of 3,907,000 metric tons (about 8.6 billion pounds) for 1962 was fulfilled by December. The landings for the first 11 months of 1962 reached 3,907,360 tons as compared with the total catch for the year 1961 of 3,724,000 metric tons (8.2 billion pounds).

The catch goal for 1963, as announced by the Premier, is 4,220,000 tons (9.3 billion pounds).

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TWO MORE FISH FREEZING VESSELS CHRISTENED IN DANISH SHIPYARD:

The M/S Davydov and the M/S Sovietsk were christened December 21, 1962. The refrigerated vessels are the last of a series of four identical fish carriers ordered by

Fig. 1 - A side view of the Soviet fish carrier M/S Skrypley, the first of a series of four identical vessels.

U. S. S. R. (Contd.):

V/O Sudoimport, Moscow, from a Copenhagen shipyard. The M/S Skryplev was the first in the series and was delivered in late November 1962. The second vessel, the M/S Vitus Bering, which was launched June 9, 1962, should be ready for delivery early in 1963. The vessels are designed to dress and freeze fish which are taken aboard by way of a stern chute from accompanying trawlers.

Fig. 2 - Stern view of Soviet fish carrier M/S Skryplev showing stern chute.

Each of the vessels has a dead weight of about 2,600 tons, is 91 meters (298.5 feet) in length between perpendiculars, and has a beam of 16 meters (52.5 feet). The main engine on all of the vessels is a 6-cylinder Diesel developing 3,530 horsepower.

The director of the shipyard building the vessels announced that his firm has built 37 vessels for the U.S.S.R. in the past 30 years, of which 25 were refrigerated vessels for V/O Sudoimport. (European Regional Fisheries Attache, United States Embassy Copenhagen, January 2, 1963.)

United Kingdom

FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority announced that, as a result of a change in the rates of interest charged to them by the Treasury, their own rates of interest on loans made as from November 17, 1962, will be as follows:

Fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years, $5\frac{1}{8}$ percent, increase $\frac{1}{4}$ percent; on loans for more than 5 years, but not more than 10 years, $5\frac{3}{8}$ percent, increase $\frac{3}{8}$ percent; on loans for more than 10 years, but not more than 15 years, $5\frac{3}{4}$ percent, increase $\frac{1}{4}$ percent; on loans for more than 15 years, but not more than 20 years, $5\frac{7}{8}$ percent, increase $\frac{1}{8}$ percent.

Processing plants: on loans for not more than 15 years, $6\frac{5}{8}$ percent, no change; for more than 15 years, but not more than 20 years, $6\frac{7}{8}$ percent, no change.

The rates on loans made before November 17 are unchanged.

Note: See Commercial Fisheries Review, November 1962 p. 83.

* * * * *

FISH STICKS ACCEPTED BY CONSUMERS:

Fish sticks (known as fish fingers in Britain) in just over seven years have become a regular part of Britain's national diet. They have now been recommended for inclusion in the Cost of Living Index.

The British company, which introduced the product to Britain in 1955, has evolved a new recipe, approved by panels of housewives and thoroughly tested in the company's research and development department at Great Yarmouth. At the company's Grimsby factory, new machinery has been designed to cut the fish.

The firm's product group manager for fish and fish products said:

"Fish fingers were introduced in 1955 and have since become a major part of the trend towards convenience foods which was noted by the National Food Survey Committee in its recent annual report."

Tne firm has set the pace in the British market, with 7 out of 10 housewives preferring the firm's brand. The company uses mostly cod fillets to produce its fish sticks.

At Grimsby the firm has a large and up-to-date plant. More fish sticks are produced there than in any other plant in Europe and many hundreds of tons are shipped each year to Australia and elsewhere as part of the company's expanding export business.

This illustrates the success of the product, the sales of which have multiplied ten times since it was introduced in 1955, for it has been estimated that more than 600,000,000 fish sticks (in number) were sold in Britain in 1961.

United Kingdom (Contd.):

Because of their impact on the total frozen food market (they represent some 16 percent of the total business and are second only to peas in importance), fish sticks have made a vital contribution to the growth and stability of the fishing industry in Great Britain.

In 1961, largely because of the demand for fish sticks, as much as 16 percent of the fish landed in Britain was quick-frozen, compared with only 8 percent in 1955 when they were introduced. (The Fishing News, British periodical, September 21, 1962.)

Zanzibar

FISHERIES DEVELOPMENT COMPANY TO SEEK EXPORT MARKETS:

The Government of Zanzibar has announced the formation of the Zanzibar Fisheries Development Company. This joint venture, in which the Government of Zanzibar holds the controlling interest, is designed to alleviate the British Protectorate's excessive economic dependence upon a single crop, cloves. Zanzibar is located off the east coast of Africa near Tanganyika.

The agreement is between the Zanzibar Government and a commercial fishing firm. The commercial company is contributing craft, gear, equipment, technicians, and expert knowledge. The new development firm commenced operation on November 11, 1962.

The main objective is to develop an export trade in fish products by exploiting fisheries resources which are beyond the present scope of local fishermen and by setting up a marketing service to handle fish caught by local fishermen which are surplus to local market requirements and suitable for the export trade. The new company will not interfere with fish supplies to local markets for so long as these are adequately supplied by local fishermen.

In order to achieve these objectives the company will be erecting necessary processing plants in the immediate future. A fish-curing plant capable of smoking and/or salting five tons of fish a day, with room for expansion to double this amount, was expected to be in operation within three months. A cold storage of 60 tons capacity with deep-freezing and ice-making plants will be in operation within 12 months. The erection of a cannery will be considered when the processing plants outlined above have been erected and are in full operation.

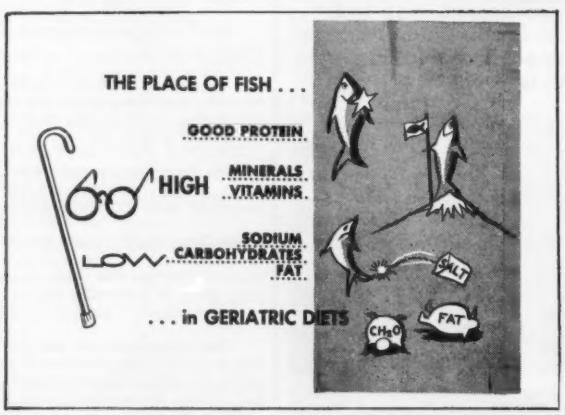
The two fishing units of the new company will initially concentrate on the catching of sardines and Indian Ocean mackerel by use of purse seines. It has been proved that those fish can be caught in quantity throughout the year in Zanzibar waters. Two additional fishing units will be built by the company in its own workshops during the next 12 months.

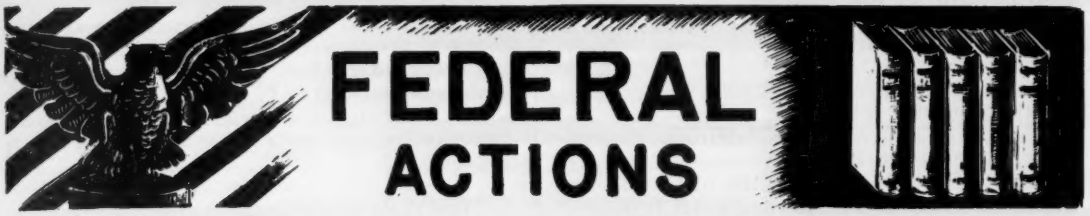
The British Freedom from Hunger Campaign has approved a scheme to investigate the tuna fishing potential in those waters. These trials will be conducted by the new company in collaboration with the East African Marine Fisheries Research Organization. Tuna schools are known to abound in those waters and it is confidently expected that their investigations will result in the large-scale development of tuna fishing by the company in the future.

The marketing service to purchase and process surplus fish caught by local fishermen will be established as soon as the cold storage is in operation. This service will undoubtedly provide the incentive necessary to develop local fisheries which are at present handicapped by the limited local market. Local fishermen will also be given practical training in the use of advanced techniques to enable them to play a full part in this development in the years to come.

Various countries are considered as possible export markets. It is anticipated that white meat tuna can be successfully sold in the United States and Europe. Northern Rhodesia, the Congo, and Greece are considered as markets for salted fish and Ceylon is thought to be a potential market for both dried and salted fish. The construction of a fish meal plant is projected for the future if conditions are found to be favorable. It is estimated that approximately 150 persons will be employed by the Fisheries Development Company by the end of 1962.

The Government of Zanzibar is placing heavy emphasis on the Fisheries Development Company. One senior Department of Agriculture official has termed it "our only hope for the future" as the Government has been unable to find additional agricultural crops that could be successfully cultivated in Zanzibar in order to produce substantial export revenues. (United States Consulate in Zanzibar, November 27, 1962.)





Department of Health, Education and Welfare

FOOD AND DRUG ADMINISTRATION

POLICY ON PACKAGED PRODUCTS "WEIGHED AT TIME OF SALE" AFFECTS FISH FILLETS:

In place of the net weight statement on foods such as bananas, meat, and fish fillets that are wrapped in cellophane or similar film at the production level, packers have been permitted to substitute a statement or instructions on the wrapper that the article is to be weighed and marked at the time of resale. But a new "statement of interpretation" issued by the U. S. Food and Drug Administration in the Federal Register of December 4, 1962, considers the articles mentioned as food in packaged form. Therefore, that agency ruled that those products must bear a new weight statement on the wrapper when shipped in interstate commerce. The new policy insists that fish fillets that are prepackaged in cellophane or similar films bear an accurate statement of the net contents, whether or not it is intended that the package be weighed and marked at the time of retail sale.

Since April 25, 1940, the producers of individually- or consumer-wrapped frozen fish products have enjoyed an exemption from marking the net weight on wrapped fish packed in 5, 10, and 20-pound cartons at the time of packing. The recent ruling cancels the old exemption.

The ruling as published in the December 4, 1962, Federal Register follows:

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER A—GENERAL

PART 3—STATEMENTS OF GENERAL POLICY OR INTERPRETATION

Net Weight Statement on Foods in Package Form That May Be Weighed at Time of Retail Sale

Under the authority vested in the Secretary of Health, Education, and Welfare by the Federal Food, Drug, and Cosmetic Act (sec. 701(a), 52 Stat. 1055; 21 U.S.C. 371(a)) and delegated to the Commissioner of Food and Drugs by the Secretary (25 F.R. 8625), and pursuant to the provisions of the Administrative Procedure Act (sec. 3, 60 Stat. 237, 238; 5 U.S.C. 1002), the following statement of interpretation is issued:

§ 3.204 Net weight statement on foods in package form that may be weighed at time of retail sale.

(a) The Food and Drug Administration has been requested to comment on industry proposals to omit the net weight statement on foods such as bananas, meat, and fish fillets that are prepackaged in cellophane or similar films and to substitute therefor statements or instructions on the label that the article is to be weighed and marked at time of retail sale. The articles that are the subject of these proposals would be food in packaged form under the Federal Food, Drug, and Cosmetic Act. Sections 403(e)(2) and 405 of the act contain authority permitting reasonable variations from the required label statement of the quantity of contents under certain conditions arising in good packing practices; exemptions for small packages and open containers of fresh fruits and fresh vegetables; and exemptions for food which is, in accordance with the practice of the trade, to be processed, labeled, or repacked at establishments other than those where originally processed or packed. However, there is no authority in the statute for exemptions such as those requested in this instance. Therefore, any such food shipped in domestic interstate commerce or imported into the United States shall bear, among other mandatory statements on the label, an accurate statement of the net contents, whether or not it is intended that such package be weighed and marked at the time of retail sale. However, under the pertinent regulations, if preferred, a minimum net weight statement may be used, rather than an average net weight statement, if all units are in excess of the minimum quantity stated and if the variations above the stated minimum are not unreasonably large.

(b) This statement cancels that contained in Trade Correspondence Letter No. 258 (TC-258), issued April 25, 1940, with reference to a similar situation involving the labeling of individually wrapped frozen fish with a statement of net contents.

(Secs. 403(e)(2), 701(a); 52 Stat. 1047, 1055; 21 U.S.C. 343(e)(2), 371(a))

Dated: November 28, 1962.

GEO. P. LARRICK,
Commissioner of Food and Drugs.

Department of the Interior

FISH AND WILDLIFE SERVICE

PROGRAM REVIEW ASSISTANT TO COMMISSIONER NAMED:

Joseph F. Puncochar of Baltimore, a longtime Federal official, has been named Assistant for Program Review in the office of the Commissioner of the Fish and Wildlife Service, Secretary of the Interior Stewart L. Udall announced on December 20, 1962. He succeeds O. Lloyd Meehean who retired December 8, 1962.

Puncochar, 50, began his new duties January 7, 1963. He was formerly research Director for the Maine Sardine Council in Bangor, a position he held for two and a half years. Prior to his present job he had been with the Fish and Wildlife Service for 24 years.

In his new position, Puncochar will be responsible for over-all Fish and Wildlife Service program review and appraisal for the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife. His responsibilities will cover such diverse programs as increasing the efficiency of the Nation's commercial fishing industry to preserving the 32 remaining wild whooping cranes.

BUREAU OF COMMERCIAL FISHERIES

REGULATIONS FOR ISSUANCE OF DESIST ORDERS AGAINST POSSIBLE RESTRAINT OF TRADE BY FISHERY COOPERATIVES:

The Department of the Interior published in the Federal Register of December 19, 1962, rules of procedure governing the issuance of cease and desist orders against the associations of producers of aquatic products that the Secretary of the Interior has reason to believe are monopolizing or restraining trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced.

The regulations became effective January 13, 1963.

Notice of the proposed form of the new regulations was published in the Federal Register of August 31, 1962. Since no new comments, suggestions, or objections were received from interested persons, the proposed regulations were adopted without change.

The new regulations give the scope of the rules, and have provisions for institution of proceeding, complaint, notice of hearing, intervention, hearing, and preparation and issuance of final decision and order.

The new regulations implement the authority given the Secretary of the Interior under section 2 of the Fishery Cooperative Marketing Act of June 25, 1934 (48 Stat. 1213; 15 U.S.C. 521-522), and section 4 (e) of the 1939 Reorganization Plan (53 Stat. 1433). The Secretary of the Interior will act through the U.S. Bureau of Commercial Fisheries in carrying out his responsibilities under the Act.

The regulations as published in the December 1962 Federal Register follow:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER I—FISHERY MARKETING COOPERATIVES

PART 290—ISSUANCE OF CEASE AND DESIST ORDERS BY THE GOVERNMENT

On pages 842 through 843 of the FEDERAL REGISTER of August 31, 1962, there was published a notice and text of proposed new Part 290 of Title 50 Code of Federal Regulations. The purpose of the new part is to set up rules of procedure for issuance of cease and desist orders under section 2 of the Fishery Cooperative Marketing Act of June 25, 1934 (48 Stat. 1213; 15 U.S.C. 521–522), and section 4(e) of 1939 Reorganization Plan (53 Stat. 1433).

Interested persons were given until September 30, 1962, to submit written comments, suggestions or objections with respect to the proposed new part. Suggestions were received from one fishery cooperative. The suggestions presented in the one response had been previously considered, therefore the proposed new part is hereby adopted without change as set forth below. This part shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: December 14, 1962.

STEWART L. UDALL,
Secretary of the Interior.

Part 290, reading as follows, is added to 50 CFR, Subchapter I—Fishery Marketing Cooperatives:

Sec.
290.1 Scope of rules.
290.2 Institution of proceeding.
290.3 Complaint.
290.4 Notice of hearing.
290.5 Service of documents.
290.6 Hearing official.
290.7 Intervention.
290.8 Hearing.
290.9 Preliminary decision by hearing official.
290.10 Argument before the Secretary.
290.11 Preparation and issuance of final decision and order.

AUTHORITY: §§ 290.1 to 290.11 issued under sec. 2, 48 Stat. 1213; 15 U.S.C. 522; 1939 Reorganization Plan No. II, 53 Stat. 1433.

§ 290.1 Scope of rules.

The Act of June 25, 1934 (48 Stat. 1213; 15 U.S.C. 521–522), the functions under which were transferred to the Secretary of the Interior by 1939 Reorganization Plan No. II, hereinafter in these rules referred to as the Act, in section 2 thereof provides a remedy whereby the associations of producers of aquatic products authorized by section 1 of the Act may be ordered by the Secretary of the Interior to cease and desist from monopolizing or restraining trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced by reason thereof. These rules implement section 2 of the Act by establishing the procedure to be followed by the Secretary of the Interior or his authorized representative, hereinafter referred to in these rules as the Secretary, in the enforcement of the section. For

rules governing practice generally before the Department of the Interior see Part 1 of Title 43, Code of Federal Regulations.

§ 290.2 Institution of proceeding.

(a) *Application to institute proceeding.* Any person having any information that an association of producers of aquatic products is monopolizing or restraining trade may file with the Secretary an application requesting the institution of such proceeding as is authorized under the Act. The application shall be in writing, signed by or on behalf of the applicant, and shall include a concise statement of the facts constituting the alleged activities and the name and address of the applicant together with the name and address of the association against which the applicant complains.

(b) *Status of the applicant.* The person filing an application as described in paragraph (a) of this section shall have no legal status in the proceeding which may be instituted as a result of the application, except where the applicant may be permitted to intervene therein, in the manner hereinafter provided, or may be called as a witness, and the applicant's identity shall not be divulged except with the applicant's prior consent or upon court order.

(c) *Who may institute.* If, after investigation of the matter complained of in the application described in paragraph (a) of this section, or upon application of another Federal agency, or after investigation made on his own motion, the Secretary has reason to believe that any association organized under the provisions of the Act is engaging in monopolization or restraint of trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced by reason thereof, he will institute a proceeding. Proceedings will be instituted only upon complaint issued by the Secretary.

§ 290.3 Complaint.

(a) *Service.* The complaint shall be served upon the association by being sent by certified mail with return receipt requested to its principal place of business or by being left with a responsible person at the association's principal place of business.

(b) *Contents.* The complaint shall state in concise terms the allegations of fact which constitute a basis for the proceeding and shall require the association to show cause why an order should not be issued requiring it to cease and desist from the activities alleged therein to be in restraint of trade.

§ 290.4 Notice of hearing.

There shall also be served upon the association a notice of hearing, which shall be attached to the complaint or contained therein, and which shall specify a day and place not less than thirty days after service thereof to appear, introduce evidence, and make arguments to show cause why an order should not be made directing it to cease and desist from monopolization or restraint of trade.

§ 290.5 Service of documents.

Copies of all pleadings, briefs, memoranda, letters, and other documents filed by or on behalf of any party or which are otherwise submitted to an official conducting any part of the proceeding for consideration in connection therewith, shall be served upon all parties or their representatives in person or by certified mail.

§ 290.6 Hearing official.

The hearing for the purpose of taking evidence and hearing arguments to determine whether an order should be issued requiring the association to cease and desist from monopolization or restraint of trade shall be conducted by a hearing official designated by the Secretary. No person shall be assigned as hearing official who (a) has any pecuniary interest in the matter or business involved in the proceeding, or (b) has participated in the investigation preceding the institution of the proceeding, in the preparation of the complaint, or in the development of the evidence to be introduced in the proceeding.

§ 290.7 Intervention.

Upon written application, interested parties shall be permitted to intervene in the proceedings when the hearing official or the Secretary shall determine that the interests of justice will be served thereby.

§ 290.8 Hearing.

(a) *Departmental counsel.* The case against the association shall be presented by a Departmental counsel appointed for that purpose. The Bureau of Commercial Fisheries shall be responsible for the case against the association and the Bureau shall be considered a party within the purview of these rules.

(b) *Conduct of hearing.* Insofar as feasible, hearings shall be informal. Parties may offer oral and written evidence, subject to the exclusion by the hearing official, in his discretion, of irrelevant, immaterial, repetitious, or hearsay evidence.

(c) *Briefs.* Briefs may be submitted on behalf of interested parties at any time prior to thirty days after the termination of the hearing.

(d) *Examination of witnesses.* Attention of witnesses shall be invited to 18 U.S.C. 1001. Testimony may be received under oath or affirmation. All witnesses may be examined or cross-examined by the hearing official and by representatives of any party.

(e) *Transcript.* The hearing official shall make provision for a complete transcript of the hearing. A copy of the transcript shall be available to interested parties upon payment of a fee prescribed by the Chief Clerk of the Department of the Interior pursuant to Part 2 of Title 43, Code of Federal Regulations, or pursuant to any applicable Departmental contract covering reporting services.

§ 290.9 Preliminary decision by hearing official.

(a) *Issuance of preliminary decision.* Following the hearing and upon completion of the time allowed for filing briefs, the hearing official shall issue a decision embodying his findings of fact and conclusions of law on all issues as to whether the association monopolizes or restrains trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced thereby. The decision of the hearing official shall be made a part of the record and a copy thereof shall be served upon all parties to the proceeding.

(b) *Filing of exceptions.* Within thirty days after service of the decision of the hearing official any party to the proceeding may file with the hearing official exceptions to his decision. This document of exceptions shall set forth separately and specifically each error asserted.

(c) *Transmittal of record.* The hearing official, immediately following the period allowed for the filing of exceptions, shall transmit to the Secretary the entire record of the proceeding.

§ 290.10 Argument before the Secretary.

(a) *Oral argument.* Unless a party has included in the exceptions a request for oral argument before the Secretary or has filed a separate request for oral argument prior to the expiration of the last date for filing such exceptions, the right to such oral argument shall be deemed to have been waived.

(b) *Briefs.* The parties may file written briefs either in addition to oral argument or in lieu thereof.

(c) *Scope of argument.* Except where the Secretary determines that argument on additional issues would be helpful, argument, whether oral or on brief, shall be limited to the issues raised by the exceptions. If the Secretary determines that additional issues should be argued, the parties or their representatives shall be given reasonable notice of such determination, so as to permit preparation of adequate argument on all the issues argued.

§ 290.11 Preparation and issuance of final decision and order.

As soon as practicable after the receipt of the record from the hearing official, or in case further proceedings were had before the Secretary, as soon as practicable thereafter, the Secretary, upon the basis of and after due consideration of the record as a whole, including that of any proceedings before him, shall prepare a final decision and an order based upon the decision. If the Secretary has found that the association is engaged in monopolization or restraint of trade in interstate or foreign commerce to such an extent that the price of any aquatic product is unduly enhanced thereby, the order shall recite the facts found by him and direct such association to cease and desist from monopolization or restraint of trade. The Secretary shall cause this order to be served upon the association. On the request of the association, or if it fails and neglects for thirty days to obey such order, the Secretary shall, in accordance with the Act, file in the district court in the judicial district in which the association has its principal place of business a certified copy of the order and of all the records in the proceeding together with a petition asking that the order be enforced and shall give notice to the Attorney General and to the association of such filing.

[F.R. Doc. 62-12495; Filed, Dec. 18, 1962; 8:46 a.m.]

Note: See Commercial Fisheries Review, October 1962 p. 72.

Interstate Commerce Commission

FEDERAL COURT ENJOINS ENFORCEMENT OF RULING ON COOKED VEGETABLES:

By an injuction granted December 6, 1962, the Federal Court in Wilmington, Del., enjoined the Interstate Commerce Commission's enforcement of its decision that french fried potatoes and other cooked vegetables were not "frozen vegetables." Fishery shippers who are also producing and distributing french fried potatoes, onion rings, candied yams, vegetables in sauce, and similar products, may now continue to use the services of formerly exempt truckers until the U. S. Supreme Court decides the case. It has been estimated that it will be at least 6 to 12 months before a final decision can be rendered.

Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISION

TUNA CANNERY WORKERS NOT INCLUDED IN WAGE ORDER PROGRAM FOR PUERTO RICO INDUSTRIES:

A review of tuna cannery wages is not included in the wage order program under the Fair Labor Standards Act for Puerto Rico through June 1963. The program was announced on November 1, 1962, by the U. S. Labor Department's Wage and Hour and Public Contracts Divisions.

It has been determined that Industry Committee Number PR-60, which will consider wages in food and related products industries, will not cover wages in the tuna canning industry. The Committee will consider only food products industries that presently have wages from 57½ cents to $1.09 an hour. Since tuna cannery workers in Puerto Rico are now paid a minimum rate of $1.15 an hour, they are excluded from the current minimum wage study by the Committee.

Department of the Treasury

COAST GUARD

RENEWAL OF MOTORBOAT NUMBERS ISSUED:

Procedures designed to expedite the renewal of the Certificate of Number issued to motorboat owners by the U.S. Coast Guard were published in the Federal Register January 5, 1963, as an amendment to 46 CFR 171.10-20, to become effective March 6, 1963. The States and areas in which the Coast Guard presently issues Certificates of Number in accordance with the Federal Boating Act of 1958 (46 U.S.C. 527-527h) are: Alaska, District of Columbia, Guam, Hawaii, Maine, New Hampshire, Pennsylvania, Tennessee, Washington, and Wyoming. The Certificate of Number issued for vessels subject to the Act is valid for a period of 3 years from the date shown thereon unless sooner revoked or cancelled.

The amended regulations state, "Numbers issued to owners of undocumented vessels pursuant to the regulations in this Part shall be renewed not later than the expiration dates shown on the Certificates of Number. The number may be renewed at any time within the 90-day period preceding the expiration date on the Certificate of Number. However, the renewal application should be received by the Coast Guard 60 days prior to the expiration date shown on the Certificate of Number . . . . ."

Form CG-3876, "Application for Number," is to be used in applying for renewal of Certificates of Number. Form CG-3876 together with instructions for submitting the application will be forwarded by the Coast Guard to owners of motorboats numbered by the Coast Guard. The form will be forwarded to owners about 90 days prior to the expiration date of their current Certificate of Number. The failure of the Coast Guard to forward such an application, or the failure of the owner to receive it, does not excuse the owner from the requirement of renewing the number on or before the expiration date shown on the Certificate of Number.

Form CG-3876 is available upon request at all First Class and Second Class Post Offices throughout the United States and at all designated Third and Fourth Class Post Offices in States in which undocumented vessels must be numbered by the Coast Guard, and at all Coast Guard Marine Inspection Offices.

Eighty-Eighth Congress

(First Session)

CONGRESS CONVENES: The first session of the 88th Congress convened January 9, 1963. Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANADROMOUS FISH CONSERVATION: H.R. 2392 (Dingell) introduced in House Jan. 21, 1963, to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several States; referred to the Committee on Merchant Marine and Fisheries. Also H.R. 3195 (Moss) introduced in House Jan. 31, 1963, referred to Committee on Merchant Marine and Fisheries.

ANTIDUMPING ACT AMENDMENT: H.R. 2575 (Dent) introduced in House Jan. 24, 1963, to amend

certain provisions of the Antidumping Act, 1921, to provide for greater certainty, speed, and efficiency in the enforcement thereof, and for other purposes; referred to the Committee on Ways and Means. Provides for certain changes in wording.

AQUATIC PLANTS ERADICATION: S. 250 (Beall et al) introduced in Senate Jan. 16, 1963, to provide for the control and progressive eradication of certain aquatic plants in the States of Maryland, Virginia, New Jersey, and Tennessee; referred to the Committee on Agriculture and Forestry. Concerns the Eurasian water milfoil which occurs in fresh brackish waters in the States named. The eradication program would involve Federal-State cooperation through the Corps of Engineers. A companion bill H.R. 2994 (Morton) was introduced in House Jan. 28, 1963; referred to the Committee on Public Works.

CHEMICAL PESTICIDES COORDINATION ACT: H.R. 2857 (Dingell) introduced in House Jan. 28, 1963, to provide for advance consultation with the Fish and Wildlife Service and with State wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls; referred to Committee on Merchant Marine and Fisheries.

COMMERCIAL FISHERIES FUND: H.R. 726 (Multer) introduced in House Jan. 10, 1963, to amend the act of Aug. 11, 1939, relating to domestically produced fishery products and to establish a fund for the advancement of commercial fisheries; referred to the Committee on Merchant Marine and Fisheries. This provides that an amount equal to 30 percent of the gross receipts collected on fishery products shall be annually apportioned by the Secretary of the Interior among those states with commercial fishing on a percentage basis. The percentage basis is determined by the ratio which the value of raw fish landed within each state for the immediately preceding year plus the value to the manufacturer of processed products within each state for the immediately preceding year bears to the total value of all raw fish landed and products processed for the most recent year within all participating states.

S. 627 (Bartlett et al) introduced in Senate Jan. 31, 1963, to promote State commercial fishery research and development projects, and for other purposes; referred to the Committee on Commerce. Authorizes the Secretary of the Interior to cooperate with the States in carrying out projects designed for research and development of commercial fishing resources and authorizes to be appropriated annually $5 million for a total 5-year program. These funds would be apportioned among the States on a matching basis according to the extent of commercial fisheries in each State as represented by the value of raw fish harvested by domestic fishing vessels and received within each State plus the average value of the fishery products manufactured within each State. To assure that each State will receive an adequate portion, a maximum of 10 percent and a minimum of one-half of 1 percent of the funds are assured under the allocation. Each State desiring to take advantage of the benefits of the act is required to submit its plans for any proposed project to the Secretary of the Interior. The Secretary has authority to approve the plans and pay to the State the Federal share of any approved project in an amount not exceeding 75 percent of the total cost.

COMMODITY PACKAGING AND LABELING: S. 387 (Hart et al) introduced in Senate Jan. 21, 1963, to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes; referred to Committee on the Judiciary. Directs the Food and Drug Administration--for foods, drugs, and cosmetics--and the Federal Trade Commission--for other consumer commodities--to promulgate regulations that will require packages accurately and clearly to give essential product information and fairly represent the contents. Identical bill, H.R. 2490 (Farbstein) introduced in House Jan. 24, 1963, referred to Committee on the Judiciary.

FISHERY MARKETING ACT AMENDMENT: H. R. 1821 (Pelly) introduced in House Jan. 14, 1963, to make clear that fishermen's organizations, regardless of their technical legal status, have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends; referred to the Committee on Merchant Marine and Fisheries. Would amend the Fisheries Marketing Act of 1934, an act originally designed to provide fishermen as primary producers with the right of self-association for cooperative improvement of their conditions. The amendment seeks to bring the Marketing Act up to date by relating it to the practical problems that presently cloud the rights of fishermen to associate themselves together, whether in unions or cooperatives and collectively bargain for a fair return on the fish harvested.

FISH HATCHERY (KENTUCKY): H. R. 123 (Siler) introduced in the House Jan. 9, 1963, to provide for the establishment of a new fish hatchery on or near the Cumberland River in the eastern part of the State of Kentucky; referred to the Committee on Merchant Marine and Fisheries.

FISHING VESSEL DISASTER LOANS: H. R. 2603 (Kilgore) introduced in House Jan. 24, 1963, to provide disaster loans to fishing vessel owners and operators adversely affected by failure of the fishery resource, and for other purposes; referred to Committee on Merchant Marine and Fisheries. Would authorize the Secretary of the Interior to make loans to fishing vessel owners or operators where he finds that a fishery production or resource disaster for credit that is not available from commercial banks, cooperative lending agencies, or other sources.

FISH PROTEIN CONCENTRATE: H. R. 741 (Bates) and H. R. 801 (Pike) introduced in House Jan. 10, 1963, to amend clause (3) of section 402(a) of the Federal Food, Drug, and Cosmetic Act, to provide that "no processed seafood product shall be deemed to consist of any such (filthy, putrid or decomposed) substance or to be otherwise unfit for food because such processed seafood product is derived from whole fish, provided such product is processed under sanitary conditions and after processing is nutritious and in no manner harmful to the health of consumers thereof;" referred to the Committee on Interstate and Foreign Commerce.

GAME & FOOD FISH CONSERVATION IN DAM RESERVOIRS: H. R. 2910 (Olsen) introduced in House Jan. 28, 1963, to direct the Secretary of the Interior to establish a research program in order to determine means of improving the conservation of game fish in dam reservoirs; referred to the Committee on Merchant Marine and Fisheries.

HIGHWAYS AND FISH AND WILDLIFE PROTECTION: S. 468 (Metcalf and Moss) introduced in Senate Jan. 24,

1963, to amend title 23 of the United States Code relating to highways in order to require the approval of the Secretary of the Interior to surveys, plans, specifications, and estimates for projects on the Federal-aid highway systems for the purpose of protecting fish and wildlife and recreation resources; referred to the Committee on Public Works. A companion bill H. R. 2996 (Olsen) was introduced in House Jan. 29, 1963, referred to Committee on Public Works.

IMPORT COMPETITION ADJUSTMENT: H. R. 1139 (St. George) introduced in House Jan. 10, 1963, to provide for adjusting conditions of competition between certain domestic industries and foreign industries with respect to the level of wages and the working conditions in the production of articles imported into the United States; referred to Committee on Ways and Means.

IMPORTED COMMODITY LABELING: S. 61 (McGee) introduced in Senate Jan. 14, 1963, to amend the Federal Food, Drug, and Cosmetic Act, as amended, to require the labeling of certain imported meats, poultry, and fish; referred to the Committee on Labor and Public Welfare. Provides that imported food products or any food products processed in the United States in whole or substantial part from imported products shall be marked or labeled to indicate to purchaser that such products were not produced in the United States. Includes sales by importers, processors, packers, jobbers, distributors, dealers, retailers, or others. Companion bill H. R. 2513 (Herlong) introduced in House Jan. 24, 1963, referred to Committee on Ways and Means.

H. R. 339 (Herlong) introduced in House Jan. 9, 1963, to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes. Would make three substantial changes in existing law: (1) it would be required that articles removed from a container be marked to show country of origin; (2) containers for articles for export to the United States must be marked to indicate that in the event of repackaging, such repackaging must contain the designation of the country of origin; (3) there is a penalty provision for failure to comply with these marking requirements applicable in the case of repackaging. Referred to the Committee on Ways and Means.

IMPORTS OF POLLUTED SHELLFISH PROHIBITED: H. R. 1777 (Colmer) introduced in House Jan. 14, 1963, to prohibit the importation into the United States of polluted shellfish; referred to the Committee on Ways and Means. Provides for investigations and studies in foreign countries relating to sanitary control of the shellfish industries. It would prohibit importation of shellfish from any country in which sanitary standards and practices are lower than the minimum requirements prescribed by the Public Health Service for the United States industry.

INDIAN FISHING RIGHTS: H. J. Res. 48 (Pelly), H. J. Res. 66 (Tollefson), and H. J. Res. 67 (Westland) introduced in House Jan. 10, 1963, regarding Indian fishing rights; all referred to Committee on Interior and Insular Affairs. Proposes to solve the problem of treaty or non-treaty Indians fishing off the reservation in violation of the State regulations. In furtherance of the purposes of any treaty with American Indians, the States involved are authorized to enact and to enforce laws of a regulatory nature concerning the time and manner of fishing outside an Indian reservation that are necessary for conservation of fish, and that are equally applicable to Indians and all other citizens without distinction.

INSPECTION OF FISHERY PRODUCTS BY INTERIOR DEPARTMENT: H. R. 2031 (Morrison) introduced in House Jan. 17, 1963, to authorize the continuation of certain inspection activites of the Secretary of the Interior; referred to the Committee on Merchant Marine and Fisheries. Would authorize the Secretary of the Interior to continue inspection of food products, other than fishery products, at request of a manufacturer or processor, provided the food product was under inspection by contract for a one-year period prior to Aug. 31, 1961.

INTERIOR DEPARTMENT APPROPRIATIONS FY 1964: H. Doc. 15, Part I, The Budget of the United States Government, Fiscal Year Ending June 30, 1964, 440 pp., printed. Contains the Budget Message of the President and other significant data to place before the Congress the President's budgetary recommendations. Also contains the facts and figures that most users of the budget would normally need or desire.

H. Doc. 16, The Budget of the United States Government, Fiscal Year Ending June 30, 1964 (Appendix), 1195 pp., printed. Contains the text of appropriation language, schedules, narrative statements on program and performance for the individual appropriations and funds, and supplementary schedules required by law with respect to details of personnel compensation. Included are funds for the Fish and Wildlife Service, its two bureaus--Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife--and the Commissioner's Office. The 1964 Budget estimate for the Office of the Commissioner is $386,000 an increase of $11,000 over the 1963 appropriation of $375,000. For the Bureau of Commercial Fisheries, the Budget estimate is $26,526,000 an increase of $906,951 as compared with the 1963 appropriation of $25,619,049. The Budget estimate of $47,754,000 for the Bureau of Sport Fisheries and Wildlife is an increase of $4,693,703 as compared with $43,060,297 the 1963 appropriation.

MEDICAL CARE FOR VESSEL PERSONNEL: H. R. 2108 (Rivers) introduced in House Jan. 17, 1963, to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel; referred to Committee on Interstate and Foreign Commerce. Identical bill H. R. 2669 (Hansen) introduced Jan. 24, 1963, referred to House Committee on Interstate and Foreign Commerce.

METRIC SYSTEM STUDY: H. R. 18 (Miller) introduced in House Jan. 9, 1963, to provide that the National Bureau of Standards shall conduct a program of investigations, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures; referred to Committee on Science and Astronautics.

H. R. 403 (Roosevelt) introduced in House Jan. 9, 1963, to provide that the Secretary of Commerce shall conduct a study to determine the practicability and desirability of the adoption by the United States of the metric system of weights and measures; referred to Committee on Science and Astronautics.

NATIONAL FISHERIES CENTER AND AQUARIUM: In the Senate on Jan. 31, 1963, pursuant to the provisions of section 5(a), of P. L. 87-758, Senators Kirwan (Ohio) and Jensen (Iowa) were appointed as members

of the National Fisheries Center and Aquarium Advisory Board.

NATURAL RESOURCES CONSERVATION POLICY: S. 57 (McGee) introduced in Senate Jan. 14, 1963, declares a national policy on conservation, development, and utilization of natural resources; referred to Committee on Interior and Insular Affairs.

OCEANOGRAPHIC RESEARCH PROGRAM: H. R. 13 (Bonner) introduced in House Jan. 9, 1963, to provide for a comprehensive, long-range, and coordinated national program in oceanography, and for other purposes; referred to the Committee on Merchant Marine and Fisheries. Also introduced in the House Jan. 10, 1963: H. R. 822 (Thompson), H. R. 880 (Dingell), H. R. 895 (Keith) and H. R. 1001 (Lennon) and H. R. 3719 (Tollefson) introduced Jan. 31, 1963; all were referred to Committee on Merchant Marine and Fisheries.

OCEANOGRAPHIC RESEARCH VESSELS: H. R. 2149 (Morrison) to require that title to certain vessels supplied directly or indirectly by the United States for oceanographic research shall remain in the United States, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

OUTDOOR RECREATION BUREAU: S. 20 (Anderson et al) introduced in Senate Jan. 14, 1963, to promote the coordination and development of the effective Federal and State programs relating to outdoor recreation, and for other purposes; referred to Committee on Interior and Insular Affairs. Authorities and responsibilities given the Secretary of the Interior through the bill would include maintenance of an inventory of outdoor recreation facilities, establishment of a classification system, provision for technical assistance, encouragement of regional cooperation by the States and developing facilities, conducting research, cooperating with educational institutions in developing personnel and disseminating recreation knowledge, and promoting coordination of Federal activities in outdoor recreation. Companion bills H. R. 1762 (Aspinall) and H. R. 1763 (Saylor) were introduced in House Jan. 14, 1963; referred to Committee on Interior and Insular Affairs.

POWER PROJECTS AND MIGRATORY FISH CONSERVATION: H. R. 2391 (Dingell) introduced in House Jan. 21, 1963, to promote the conservation of migratory fish and game by requiring certain approval by the Secretary of the Interior of licenses issued under the Federal Power Act; referred to the Committee on Interstate and Foreign Commerce.

PRICE-QUALITY STABILIZATION: H. R. 457 (Cederberg) introduced in House Jan. 9, 1963, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; referred to Committee on Interstate and Foreign Commerce. Identical bill H. R. 2564 (Dent) introduced in House Jan. 24, 1963, referred to Committee on Interstate and Foreign Commerce.

SALMON DEVELOPMENT PROGRAM IN CALIFORNIA: H. R. 94 (Holland) introduced in House Jan. 9, 1963, to direct the Secretary of the Interior to initiate a salmon and steelhead development program in California; referred to the Committee on Merchant Marine and Fisheries. Would authorize an anadromous fish development program in California. Existing facilities of the Bureau of Sport Fisheries and Wildlife of the Fish and Wildlife Service and those of the California Department of Fish and Game shall be utilized to the fullest extent.

SALMON IMPORT RESTRICTIONS: H. R. 105 (Pelly) introduced in House Jan. 9, 1963, to facilitate the application and operation of the Fish and Wildlife Act of 1956 and for other purposes; referred to the Committee on Merchant Marine and Fisheries. Would make it unlawful to import salmon taken by any country that allows high-seas net fishing for salmon without proper conservation measures. Companion bill S. 471 (Magnuson) introduced in Senate Jan. 24, 1963; referred to Committee on Commerce.

SALMON RIVER ANADROMOUS FISH: H. R. 2920 (Westland) introduced in House Jan. 28, 1963, to provide for the conservation of anadromous fish and spawning areas in the Salmon River, Idaho; referred to Committee on Interstate and Foreign Commerce.

SHRIMP IMPORTS: H. R. 822 (Thompson) introduced in House Jan. 10, 1963, to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimps and shrimp products, to impose a duty on all unprocessed shrimp imported in excess of the applicable quota, and to impose a duty on processed shrimp and prohibit its importation in excess of the applicable quota; referred to the Committee on Ways and Means.

H. R. 1774 (Colmer) introduced in House Jan. 14, 1963, to provide for an ad valorem duty on the importation of shrimp; referred to the Committee on Ways and Means.

SEAMEN'S PHYSICAL REQUIREMENTS: H. R. 77 (Bonner) introduced in House Jan. 9, 1963, to encourage and promote safety in the merchant marine by requiring that seamen on vessels of the United States meet certain physical requirements. Bill would cover many fishermen on vessels of 5 net tons and over. The Secretary of the Treasury, acting through the Commandant of the Coast Guard would establish physical qualifications for all positions on vessels of the United States. Those fishermen who are "employed on board in the care, preservation, or navigation of any vessel of the United States" would apparently be included.

SMITHSONIAN INSTITUTE & MARINE & AQUATIC BIOLOGICAL RESEARCH: H. R. 2653 (Cannon) introduced in House Jan. 24, 1963, to authorize expanded programs of research in marine natural history by the Smithsonian Institution, and for other purposes; referred to the Committee on House Administration.

STERN RAMP TRAWLERS: H. R. 1025 (Bates) introduced in House Jan. 10, 1963, to authorize the Secretary of the Interior to construct two modern stern ramp trawlers to be used for research, and for other purposes; referred to Committee on Merchant Marine and Fisheries. Also H. R. 1603 (Glenn) introduced in House Jan. 14, 1963; referred to Committee on Merchant Marine and Fisheries.

H. J. Res. 194 (Westland) introduced in House Jan. 24, 1963, to authorize the Secretary of Commerce to construct a modern stern ramp trawler to be used for research purposes and authorizing the appropriation of funds; referred to the Committee on Merchant Marine and Fisheries.

SUBMERGED LANDS ACT: H. R. 116 (Roberts) and H. R. 360 (Huddleston) introduced in House Jan. 9, 1963, to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana, as extending 3 marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals, and natural resources, within said boundaries; both referred to the Committee on the Judiciary. Also introduced in House Jan. 10, 1963, H. R. 937 (Seldon) and H. R. 1031 (Boggs), Jan. 14, 1963, H. R. 1772 (Colmer); Jan. 17, 1963 H. R. 2153 (Morrison); all referred to Committee on the Judiciary.

TRADE EXPANSION ACT AMENDMENT: H. R. 2912 (Reuss) and S. 541 (Douglas) introduced in the House and the Senate Jan. 28, 1963, to amend the Trade Expansion Act of 1962 to extend the provisions applicable in respect to the European Economic Community to the European Free Trade Association, and to require that each category of articles designated under section 211 of such act be identifiable by not less than four digits; referred to the Senate Committee on Finance and the House Committee on Ways and Means. Would allow the dominant supplier clause of the act to apply to the United States and the Common Market and any nation of the European Free Trade Association so designated by the President. Allows the dominant supplier clause to be applied not only to the European Six, but also to Great Britain and to any of the other countries of EFTA which are designated by the President.

S. 602 (Javits) introduced in Senate Jan. 30, 1963, to authorize the President, in carrying out trade agreements with fully developed countries or areas, to reduce duties below the limitation set forth in section 201 (b)(1) of the Trade Expansion Act of 1962, and for other purposes; referred to the Committee on Finance. Will enable the United States to offer "full economic partnership" to Great Britain and to the Commonwealth countries.

WATER POLLUTION CONTROL ADMINISTRATION: S. 649 (Muskie and Humphrey), H. R. 3166 (Blatnik) and H. R. 3167 (Dingell) were introduced in the House and the Senate on Jan. 31, 1963, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate or navigable waters, and for other purposes; referred to the Senate and House Committee on Public Works.

VESSEL COLLISION LIABILITY: H. R. 1070 (Garmatz) introduced in House Jan. 10, 1963, to unify apportionment of liability in cases of collision between vessels and related casualties; referred to Committee on Merchant Marine and Fisheries. Companion bill S. 555 (Bartlett) introduced in Senate Jan. 28, 1963, referred to the Committee on Commerce.

VESSEL CONSTRUCTION SUBSIDY AMENDMENTS: H. R. 1026 (Bates) introduced in House Jan. 10, 1963, to amend the act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes; referred to the Committee on Merchant Marine and Fisheries. Would amend the law which provides a construction differential subsidy for fishing vessels by extending the life of the program from June 12, 1963 to June 30, 1972; by increasing the amount of the subsidy from a maximum of one third to a maximum of one-half of the construction costs; and by broadening the scope of the law to permit participation by fisheries not eligible under the present law. Also H. R. 1604 (Glenn) introduced Jan. 14, 1963, H. R. 2172 (Tollefson) introduced Jan. 17, 1963, and H. R. 2643 (Tollefson) introduced Jan. 24, 1963; all referred to House Committee on Merchant Marine and Fisheries.

VESSEL MEASUREMENT: H. R. 81 (Bonner) introduced in House Jan. 9, 1963, to simplify the admeasurement of small vessels. Would substitute for present complicated method of tonnage measurement a new system which would permit the assignment of tonnages from a table on the basis of length and breadth only. Tonnage would be limited to self-propelled vessels of less than 500 gross tons and nonself-propelled vessels of not more than 997 gross tons. Referred to Committee on Merchant Marine and Fisheries.

VESSEL OPERATORS LICENSES: H. R. 1055 (Chamberlin) introduced in House Jan. 9, 1963, to provide for the licensing of operators of vessels numbered under the provisions of the Federal Boating Act of 1958. Fishing vessels are not specifically mentioned but the terms of the proposal would require licensed operators for fishing vessels which are undocumented and propelled by machinery of more than 10 horsepower. Referred to Committee on Merchant Marine and Fisheries.

VESSEL OWNERS LIABILITY: H. R. 1069 (Garmatz) introduced in House Jan. 10, 1963, to limit the liability of shipowners, and for other purposes; referred to the Committee on Merchant Marine and Fisheries. A companion bill S. 556 (Bartlett) was introduced in Senate Jan. 28, 1963; referred to the Committee on Commerce.

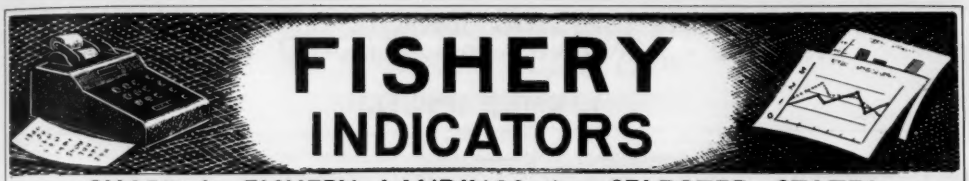
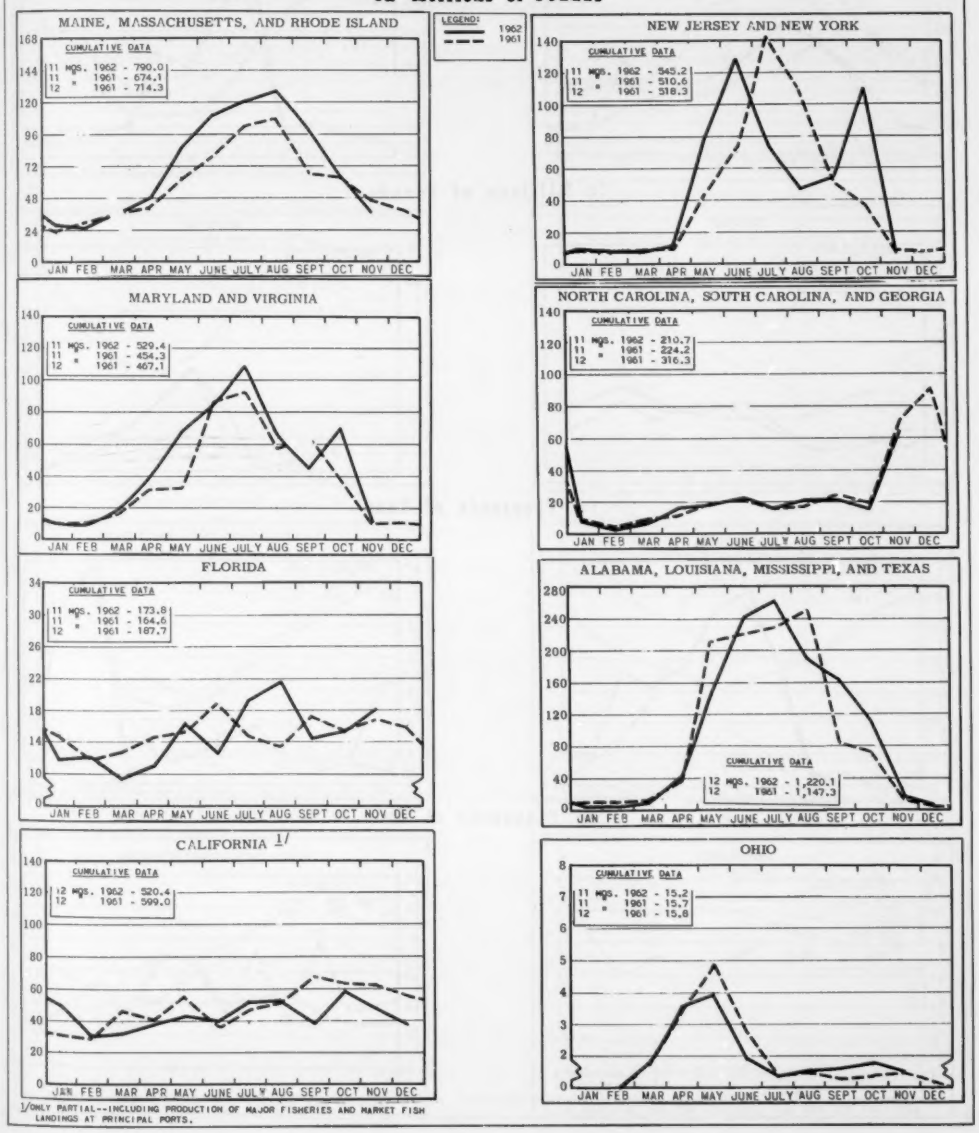


CHART 1 - FISHERY LANDINGS for SELECTED STATES

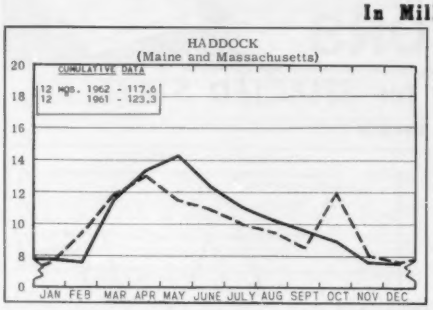
In Millions of Pounds

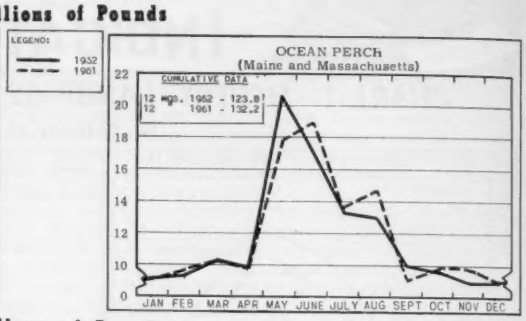

MAINE, MASSACHUSETTS, AND RHODE ISLAND
CUMULATIVE DATA
11 MOS. 1962 - 790.0
11 " 1961 - 674.1
12 " 1961 - 714.3
LEGEND: 1962 1961
NEW JERSEY AND NEW YORK
CUMULATIVE DATA
11 MOS. 1962 - 545.2
11 " 1961 - 510.6
12 " 1961 - 518.3
MARYLAND AND VIRGINIA
CUMULATIVE DATA
11 MOS. 1962 - 529.4
11 " 1961 - 454.3
12 " 1961 - 467.1
NORTH CAROLINA, SOUTH CAROLINA, AND GEORGIA
CUMULATIVE DATA
11 MOS. 1962 - 210.7
11 " 1961 - 224.2
12 " 1961 - 316.3
FLORIDA
CUMULATIVE DATA
11 MOS. 1962 - 173.8
11 " 1961 - 164.6
12 " 1961 - 187.7
ALABAMA, LOUISIANA, MISSISSIPPI, AND TEXAS
CUMULATIVE DATA
12 MOS. 1962 - 1,220.1
12 " 1961 - 1,147.3
CALIFORNIA 1/
CUMULATIVE DATA
12 MOS. 1962 - 520.4
12 " 1961 - 599.0
OHIO
CUMULATIVE DATA
11 MOS. 1962 - 15.2
11 " 1961 - 15.7
12 " 1961 - 15.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

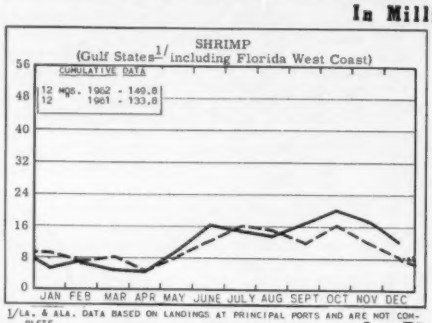
CHART 2 - LANDINGS for SELECTED FISHERIES

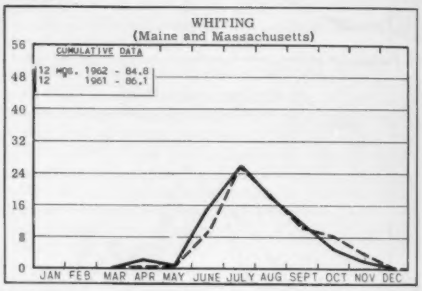
In Millions of Pounds


HADDOCK
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1962 - 117.6
12 " 1961 - 123.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



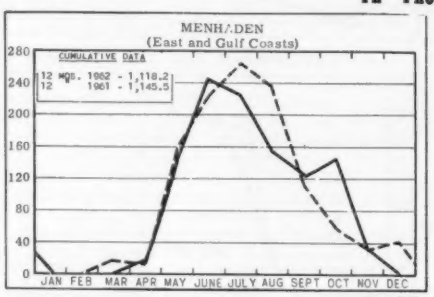
In Millions of Pounds

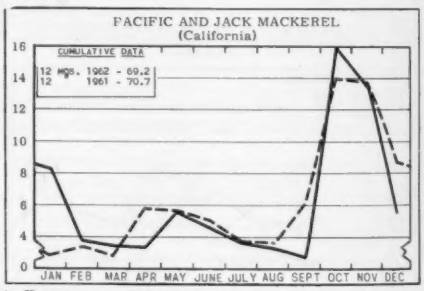

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
12 MOS. 1962 - 140.8
12 " 1961 - 133.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1962 - 84.8
12 " 1961 - 86.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

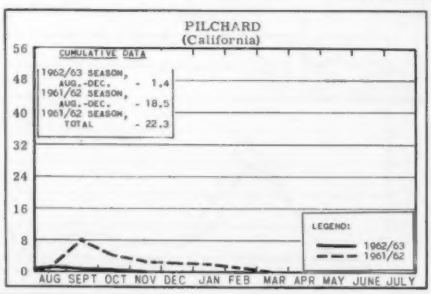
1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
12 MOS. 1962 - 1,118.2
12 " 1961 - 1,145.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
12 MOS. 1962 - 69.2
12 " 1961 - 70.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons



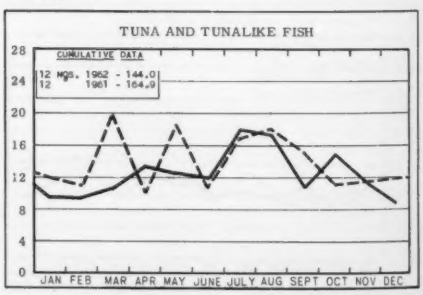
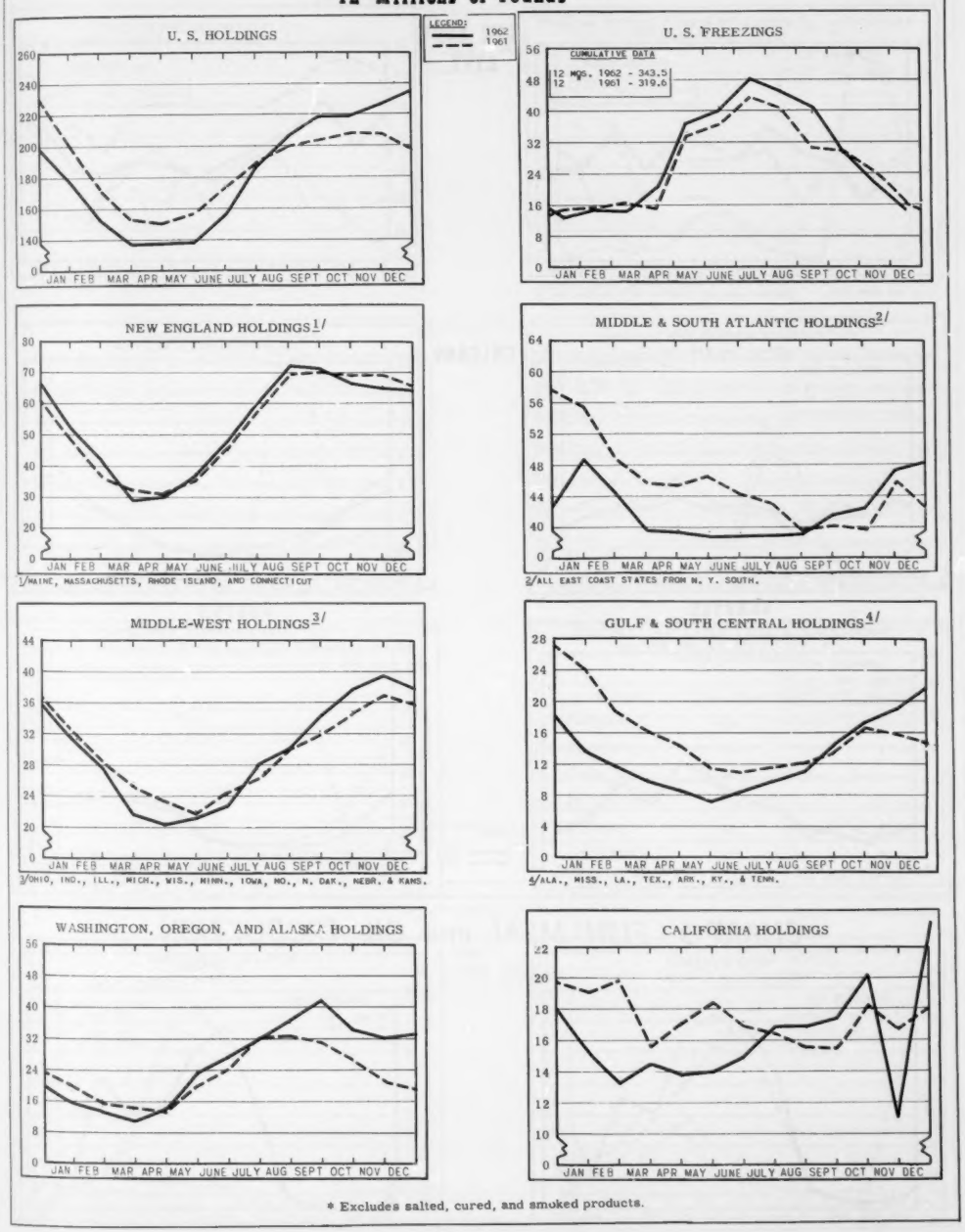


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. HOLDINGS
LEGEND: 1962 1961
U. S. FREEZINGS
CUMULATIVE DATA
12 mos. 1962 - 343.5
12 " 1961 - 319.6
NEW ENGLAND HOLDINGS 1/
MIDDLE & SOUTH ATLANTIC HOLDINGS 2/
MIDDLE-WEST HOLDINGS 3/
GULF & SOUTH CENTRAL HOLDINGS 4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT

2/ALL EAST COAST STATES FROM N. Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

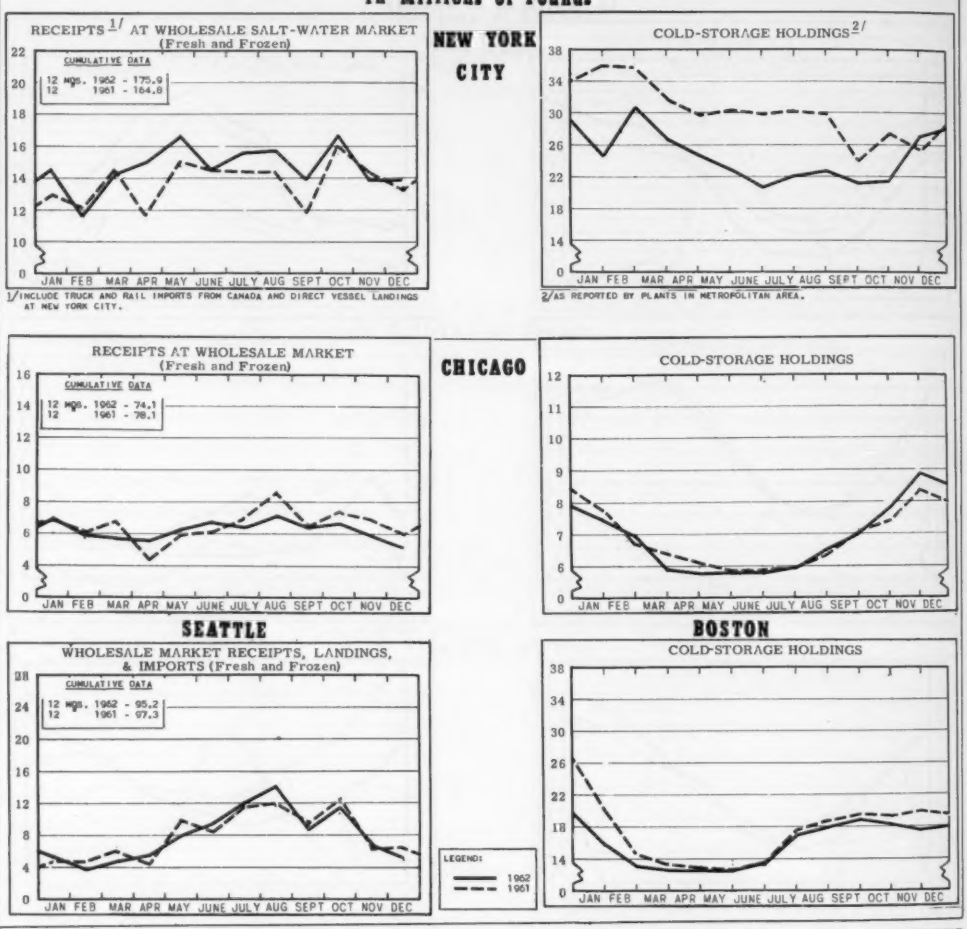

RECEIPTS 1/ AT WHOLESALE SALT-WATER MARKET
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1962 - 175.8
12 " 1961 - 164.8
NEW YORK CITY
COLD-STORAGE HOLDINGS 2/
1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.
RECEIPTS AT WHOLESALE MARKET
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1962 - 74.1
12 " 1961 - 78.1
CHICAGO
COLD-STORAGE HOLDINGS
SEATTLE
WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1962 - 95.2
12 " 1961 - 97.3
BOSTON
COLD-STORAGE HOLDINGS
LEGEND:
1962
1961
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 5 - FISH MEAL and OIL PRODUCTION

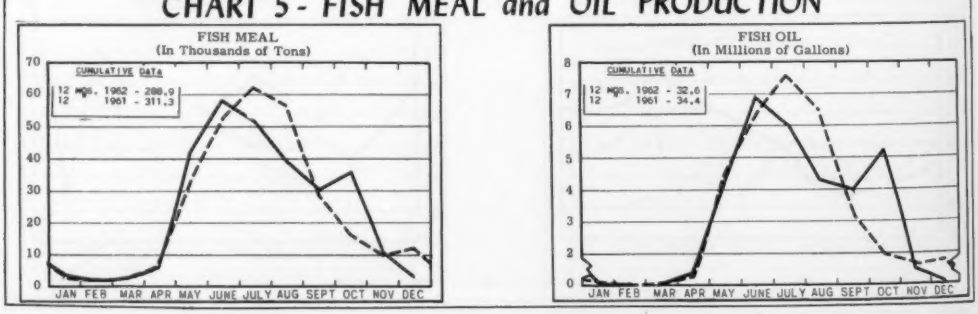
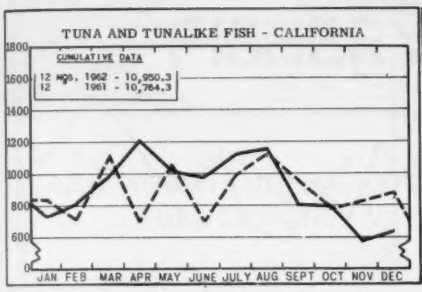
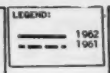
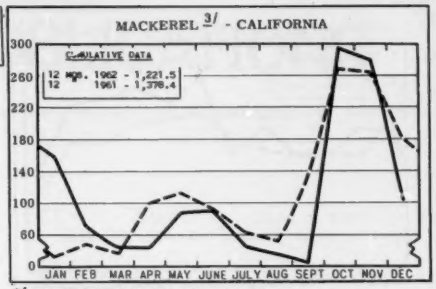

FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
12 MOS. 1962 - 288.9
12 " 1961 - 311.3
FISH OIL
(In Millions of Gallons)
CUMULATIVE DATA
12 MOS. 1962 - 32.6
12 " 1961 - 34.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

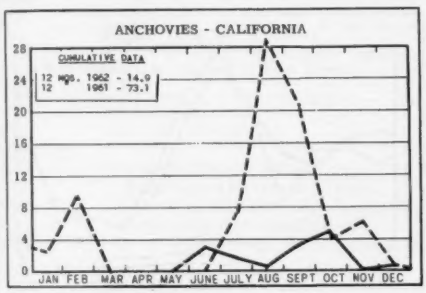
In Thousands of Standard Cases

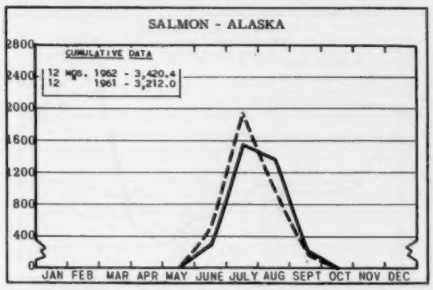

TUNA AND TUNALIKE FISH - CALIFORNIA
CUMULATIVE DATA
12 MOS. 1962 - 10,950.3
12 " 1961 - 10,764.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

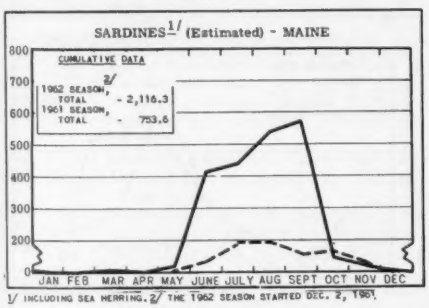




3/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



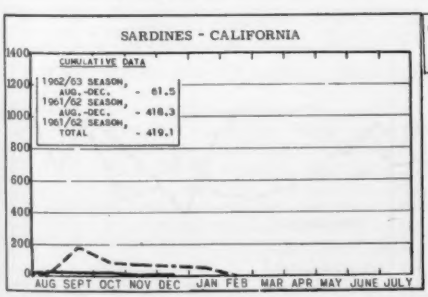


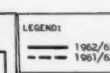

SARDINES 1/ (Estimated) - MAINE
CUMULATIVE DATA
1962 SEASON, TOTAL - 2,116.3 2/
1961 SEASON, TOTAL - 753.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDING SEA HERRING. 2/ THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.


SARDINES - CALIFORNIA
CUMULATIVE DATA
1962/63 SEASON, AUG.-DEC. - 61.5
1961/62 SEASON, AUG.-DEC. - 418.3
1961/62 SEASON, TOTAL - 419.1
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY



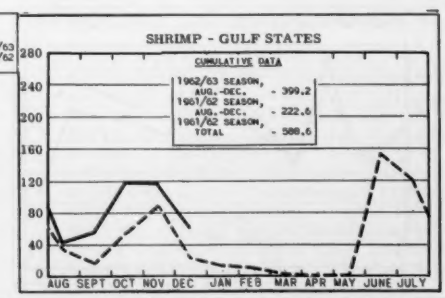
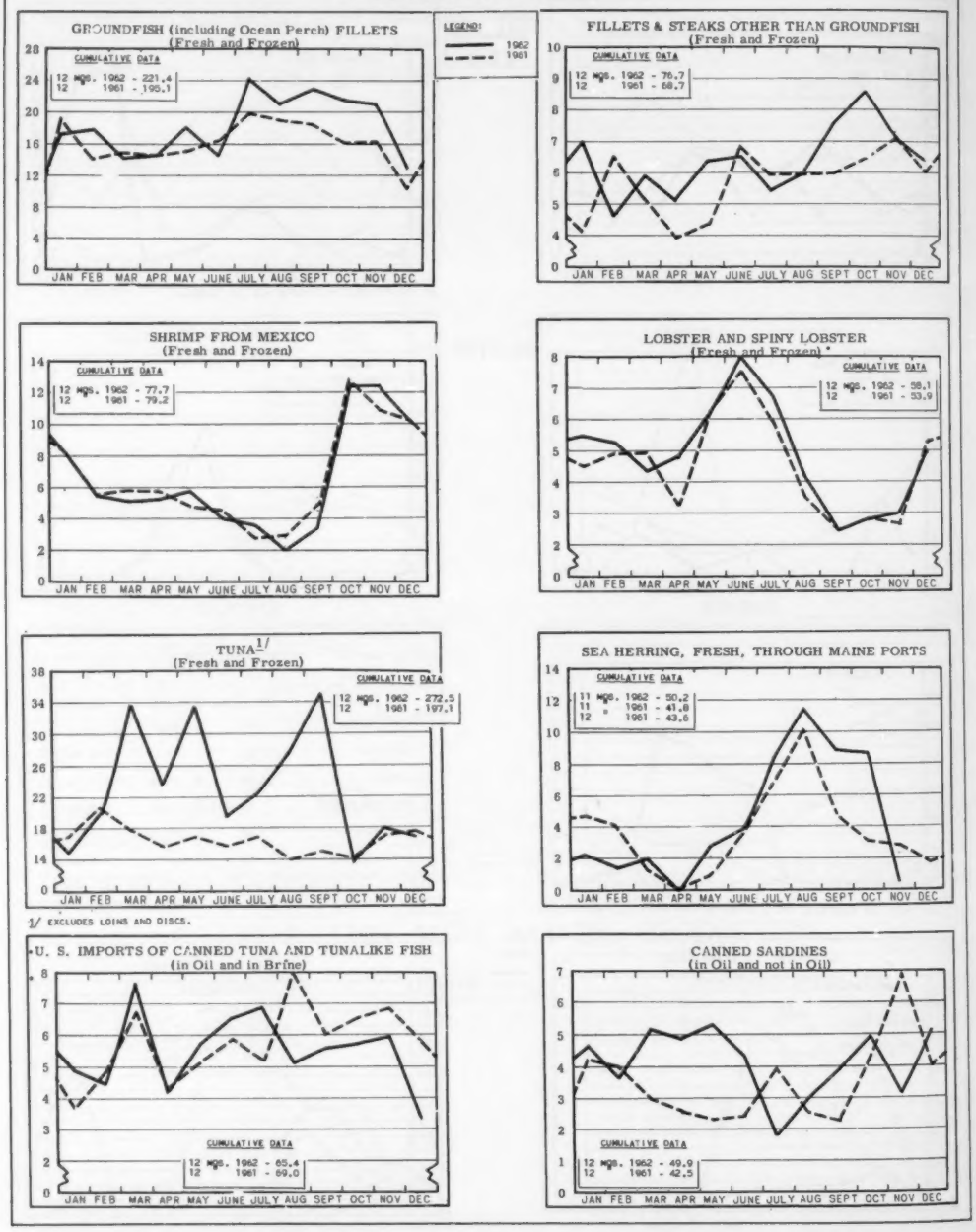
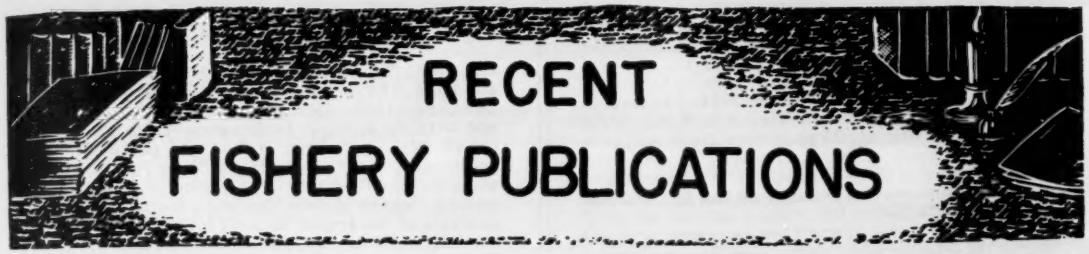

SHRIMP - GULF STATES
CUMULATIVE DATA
1962/63 SEASON, AUG.-DEC. - 399.2
1961/62 SEASON, AUG.-DEC. - 222.6
1961/62 SEASON, TOTAL - 588.6
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (including Ocean Perch) FILLETS
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1962 - 221.4
12 " 1961 - 195.1
LEGEND:
1962
1961
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
FILLETS & STEAKS OTHER THAN GROUNDFISH
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1962 - 76.7
12 " 1961 - 68.7
SHRIMP FROM MEXICO
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1962 - 77.7
12 " 1961 - 79.2
LOBSTER AND SPINY LOBSTER
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1962 - 38.1
12 " 1961 - 33.9
TUNA 1/
(Fresh and Frozen)
CUMULATIVE DATA
12 MOS. 1962 - 272.5
12 " 1961 - 197.1
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
11 MOS. 1962 - 50.2
11 " 1961 - 41.8
12 " 1961 - 43.6
U. S. IMPORTS OF CANNED TUNA AND TUNALIKE FISH
(in Oil and in Brine)
CUMULATIVE DATA
12 MOS. 1962 - 65.4
12 " 1961 - 69.0
CANNED SARDINES
(in Oil and not in Oil)
CUMULATIVE DATA
12 MOS. 1962 - 49.9
12 " 1961 - 42.5

1/ EXCLUDES LOINS AND DISCS.



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR.-FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number — Title

CFS-2862 - Canned Fishery Products, 1961 Annual Summary (Revised), 16 pp.
CFS-2863 - Industrial Fishery Products, 1961 Annual Summary (Revised), 9 pp.
CFS-3005 - Oregon Landings, 1961 Annual Summary, 2 pp.
CFS-3006 - Washington Landings, 1961 Annual Summary, 2 pp.
CFS-3010 - New England Fisheries, 1961 Annual Summary, 10 pp.
CFS-3020 - Frozen Fish Report, October 1962, 8 pp.
CFS-3028 - Louisiana Landings, July 1962, 2 pp.
CFS-3029 - Texas Landings, July 1962, 3 pp.
CFS-3030 - Texas Landings, August 1962, 3 pp.
CFS-3034 - New Jersey Landings, September 1962, 4 pp.
CFS-3035 - Georgia Landings, September 1962, 2 pp.
CFS-3037 - North Carolina Landings, September 1962, 3 pp.
CFS-3040 - Fish Meal and Oil, September 1962, 2 pp.
CFS-3041 - Louisiana Landings, August 1962, 2 pp.
CFS-3042 - South Carolina Landings, September 1962, 2 pp.
CFS-3043 - Chesapeake Fisheries, 1961 Annual Summary, 8 pp.
CFS-3045 - California Landings, August 1962, 4 pp.
CFS-3046 - Mississippi Landings, September 1962, 3 pp.
CFS-3047 - Rhode Island Landings, September 1962, 3 pp.
CFS-3048 - Wisconsin Landings, September 1962, 2 pp.
CFS-3049 - Virginia Landings, September 1962, 4 pp.
CFS-3050 - Louisiana Landings, September 1962, 2 pp.
CFS-3053 - New York Landings, September 1962, 4 pp.
CFS-3057 - Maine Landings, September 1962, 4 pp.
CFS-3058 - Maryland Landings, October 1962, 3 pp.
CFS-3059 - Fish Meal and Oil, October 1962, 2 pp.
CFS-3063 - Florida Landings, October 1962, 8 pp.

FL-91 - Turtles in the Home Aquarium, 2 pp., May 1962 (Revised).

FL-539 - List of Circulars of the U. S. Fish and Wildlife Service, by Lola T. Dees, 11 pp., May 1962.

FL-542 - Fisheries Loans for Vessels, Gear, and Research--Policies, Applications, Repayments, 9 pp., printed, August 1962. The Fisheries Loan Fund, established by the Fish and Wildlife Act of 1956, authorizes the Secretary of the Interior to approve loans to owners of fishing vessels and fishing gear, and to persons doing research into basic problems of the fisheries. It is a revolving fund which must be returned to the U. S. Treasury on June 30, 1965. This leaflet discusses loan purposes, credit requirements, eligibility, loan terms, collateral, and loan applications. It also covers processing applications, compensation for services, loan closing, repayment of loan, and insurance requirements.

Sep. No. 664 - Shellfish Hatcheries and Their Future.

Sep. No. 665 - Modifications of Chesapeake Bay Commercial Crab Pot.

Sep. No. 666 - Fish Consumption by Food Stamp and Related Low-Income Families.

SSR.-Fish. No. 427 - Whirling Disease of Trouts Caused by Myxosoma cerebralis in the United States, by Glenn L. Hoffman, Clarence E. Dunbar, and Arthur Bradford, 17 pp., illus., June 1962.

Effects of Pesticides on Fish and Wildlife: A Review of Investigations during 1960, Circular 143, 57 pp., processed, 1962.

List of Research Reports (Bureau of Sport Fisheries and Wildlife), 5 pp., August 1962.

List of Special Scientific Reports--Wildlife (Bureau of Sport Fisheries and Wildlife), 5 pp., August 1962.

The 1960 Salt-Water Angling Survey, by John R. Clark, Circular 153, 40 pp., 1962. An opportunity to obtain estimates of the sport catch of salt-water fish for the whole country was provided by the 1960 National Survey of Fishing and Hunting, conducted by the Bureau of the Census for the Bureau of Sport Fisheries and Wildlife. This survey had as its purpose a determination of the economic significance of both sport fishing and hunting. A plan for estimating angler's catches was included by special arrangements with the Bureau of the Census. The information resulting from the supplementary salt-water survey is the subject of this report.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 777 14TH ST. NW., WASHINGTON 5, D. C.

Number Title
MNL-13 - Indian Fishing Industry, 1961, 23 pp.
MNL-62 - Centolla Industry in Tierra del Fuego (Argentina-Chile), 33 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, October 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, November 1962, 9 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures for the month indicated.

Halibut and Troll Salmon Landings and Ex-Vessel Prices for Seattle, Alaska Ports and British Columbia, 1962-61, 35 pp., December 1962. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., Seattle 4, Wash.) Gives landings and ex-vessel prices of troll salmon and halibut at leading United States ports of the Pacific Coast; ex-vessel halibut prices and landings at leading British Columbia ports; United States and Canadian Pacific Coast halibut landings, 1936-1962; Seattle season averages of ex-vessel halibut prices, 1952-1962; and troll salmon landings and receipts at Seattle and Alaska ports, with comparative data.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, November 1962, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, lower Northern Neck and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, October 1962, 23 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices by species for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by type of gear; for the month indicated.

New England Whiting Fishery, and Marketing of Whiting Products, 1946-61, by John J. O'Brien, 41 pp., illus., December 1962. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Summarizes all the pertinent data scattered through many Market News Service reports and other publications for a period of years on the whiting fishery of New England. Included is a brief analysis of the trends in the 1946-61 period, and all the important developments that affected the New England whiting fishery and the marketing of whiting products. The introduction gives some of the history of the fishery. This report was prepared as an aid to those in the industry producing whiting and marketing whiting products and the economists, biologists, and technologists studying the whiting fishery and industry.

New York City's Wholesale Fishery Trade--Monthly Summary--October 1962, 20 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and freshwater sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

Role of Fish in Diets for Control of Blood Cholesterol Levels, by Maurice E. Stansby, Commercial Fisheries TL 32, 6 pp., processed, February 1961. (Branch of Technology, U. S. Bureau of Commercial Fisheries, Washington 25, D. C.) The purpose of this report is to amplify on the role of fish in human diets with respect to the effect on blood cholesterol levels, and to show how increasing the consumption of fish may be beneficial. Discusses factors controlling incidence of atherosclerosis, polyunsaturated fatty acids, use of oily fish in the diet, and use of non-oily fish in the diet.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, November 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; direct shipments to local dealers from local and non-local sources; coastwise shipments from Alaska by scheduled and nonscheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

The Spiny Dogfish - a Review, by Albert C. Jensen, Robert L. Edwards, and George C. Matthiessen, Report No. 61-7, 42 pp., processed. (U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., 1961.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE BRANCH OF FOREIGN FISHERIES AND TRADE, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

The Development of the Sakhalin and Kurile Islands Fishing Industry, by Sh. Nadibaidze, 5 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 37, no. 12, 1961, pp. 6-11.)

Exploitation of New Fisheries in the Far East, by M. Drozdov, 5 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 37, no. 10, October 1961, pp. 46-50.)

Ocean Perch Fishing in the Bering Sea, 2 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 37, no. 12, 1961, pp. 53-57.)

The Tasks of the Fishing Industry in 1962 for Far Eastern Fishermen, 2 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 38, no. 1, 1962, pp. 3-8.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, 2725 MONTLAKE BLVD., SEATTLE, WASH.

Air Transportation of Fish Species in Soviet Russia, by E. Loktionov, 2 pp., processed. (Translated from the Norwegian, Fiskets Gang, vol. 47, no. 44, November 2, 1961, p. 707.)

Observations of Fish-Shoals from an Aeroplane, by Shizuo Takashima and Yoshiji Ogawa, 2 pp., processed. (Translated from the Japanese, Gyoruigaku Zasshi, vol. 8, nos. 3-4, July 1961, pp. 65-68.)

Lipids of the Muscle of Tuna, THYNNUS ORIENTALIS. VII--Distribution of Lipids in Dark-Colored Muscle, Ordinary Muscle, and Several Other Tissues, by Muneo Katada, Koichi Zama, and Hisanao Igarashi, 7 pp., processed. (Translated from the Japanese, Nihon Suisan-Gakkai Shi, vol. 26, no. 4, April 1960, pp. 425-429.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

Atlas of the Oceanographic Climate of the Hawaiian Islands Region, by Gunter R. Seckel, Fishery Bulletin 193 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61, pp. 371-427), 61 pp., illus., printed, 40 cents, 1962.

Effect of Certain Electrical Parameters and Water Resistivities on Mortality of Fingerling Silver Salmon, by John R. Pugh, Fishery Bulletin 208 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 223-234), 16 pp., illus., printed, 15 cents, 1962.

Pompanos (TRACHINOTUS Sp.) of South Atlantic Coast of the United States, by Hugh M. Fields, Fishery Bulletin 207 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 189-222), 38 pp., illus., printed, 30 cents, 1962.

Sport Fishing--Today and Tomorrow, ORRRC Study Report 7, 137 pp., illus., printed, 65 cents, 1962. A report to the Outdoor Recreation Resources Review Commission. Following a survey conducted by the Bureau of Sport Fisheries and Wildlife, the following recommendations were made: (1) the sport fisheries should receive wider recognition as a resource of national significance; (2) provision of recreational fishing should be recognized as one phase of water-resource management, where all compatible uses are encouraged and developed; (3) three main problems that must be given attention--(a) greater provision for public access to all types of water, (b) correction and prevention of damaging pollution and siltation in all waters, (c) improved financing; (4) the need for more facts to guide the management of fishery resources is imperative; (5) some areas of responsibility for sport fishing are not clear, especially in the marine waters; (6) strong efforts must be taken to preserve and protect natural shorelines of large rivers, lakes, ocean beaches, and estuaries from physical damage and destruction; and (7) waters affording fishing opportunities near large centers of population are one of the most critical needs of the fishing public.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADDITIVES:

"Food Additives. V--Antioxidative Effect of Sulfur-Containing Fatty Acids on Vitamin A in Fish-Liver Oil," by Masuo Akagi and Isamu Aoki (Hokkaido University, Sapporo, Japan), article, Chemical Abstracts, vol. 55, September 4, 1961, 17933f, printed. The American Chemical Society, 1155 16th St NW., Washington, D. C.

ALGAE:

"The Blue-Green Algae of the Philippines," by Gregorio T. Velasquez (University of the Philippines, Quezon City, Philippines), article, The Philippine Journal of Science, vol. 91, no. 3, September 1962, pp. 267-380, illus., printed, single copy $2. National Institute of Science and Technology, P. O. Box 774, Manila, Philippines.

"El Comercio de Algas en Espana" (The Algae Industry in Spain), by Jose Maria Visea, article, Industrias Pesqueras, vol. 36, no. 851, October 1, 1962, p. 338, printed in Spanish, single copy 10 ptas. (about 17 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2°, Vigo, Spain.

Investigations Regarding the Distribution of Carrageen Algae. Our Investigations Regarding the Distribution of Carrageen Algae in Nordland, by Gulbrand Lunde and Sigurd Lunde, 11 pp., printed. (Translated from the Norwegian, Fiskeridirektoratets Skrifter, Serie Havundersokelser, vol. 5, no. 5, 1938, pp. 6-19.) Technical Services Branch, Division of Oceanography, U. S. Navy Hydrographic Office, Washington 25, D. C.

"Seasonal Aspect of the Marine Algal Flora of St. Lucie Inlet and Adjacent Indian River, Florida," by Ronald C. Phillips, article, Quarterly Journal of the Florida Academy of Science, vol. 24, no. 2, 1961, pp. 135-147, illus., printed. Quarterly Journal of the Florida Academy of Science, University of Florida, Gainsville, Fla.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ANCHOVY:

"The Maturation Process in Anchovy," by F. Alm, article, Arsredogorelse, July 1, 1959-June 30, 1960, SIK-Rapport No. 90, pp. 43-44, printed. Svenska Instututet for Konserveringsforskning, Goteborg, Sweden, 1960.

ANTIBIOTICS:

"Influence of Tetracycline Antibiotics on the Spoilage of Herring (C. harengus)," by N. N. De Silva, and R. B. Hughes (Torry Research Station, Aberdeen, Scotland), article, Journal of the Science of Food and Agriculture, vol. 13, March 1962, pp. 161-168, printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

BARENTS SEA:

Soviet Investigations on the Biology of the Cod and Other Demersal Fishes of the Barents Sea, by N. Maslov, 42, pp., printed. (Translated from the Russian, article, Soviet Fishery Investigations in North European Seas, 1960, pp. 185-230.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England, 1962.

BELGIUM:

Marking and Labeling Requirements of Belgium, WTIS Part 2, Operations Report No. 62-60, 2 pp., printed, 10 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., October 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on the mark-of-origin requirement; regulations for marking specific types of goods; labeling requirements for canned foodstuffs, artificial coloring of foodstuffs, all products prepared for retail sale; and other related information.

BIOCHEMISTRY:

"Enzymic Studies on the Glycolysis of Fish Muscle. II--Colorimetric Method for the Determination of Sugars in Muscles," by Fumio Nagayama and others (Tokyo University of Fisheries, Tokyo, Japan), article, Chemical Abstracts, vol. 55, May 15, 1961, 9546d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Simple Method of the Determination of the Glycogen Content of Marine Animals," by V. V. Srinivasan and S. Krishnaswamy (University of Madras, Madras, India), article, Chemical Abstracts, vol. 56, March 19, 1962, 6302i, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

BRAZIL:

Atividades do "Albocora" em 1960 (Activities of the Albacore in 1960), by Melquiades Pinto Paiva and Maria Ivone Mota, Boletim No. 4, 18 pp., illus., printed in Portuguese. Universidade do Ceara, Estacao de Biologia Marinha, Fortaliza, Brazil.

Sudene, Boletim de Estudos de Pesca, vol. 2, no. 7, July 1962, 24 pp., printed in Portuguese. Departamento de Estudos Especiais, Division de Pesca, Superintendencia do Desenvolvimento do Nordeste, Edificio Juscelino Kubitschek, 12° Andar, Recife, Brazil. Includes, among others, the following articles: "Sobre a biologia da lagosta Cabo-verde Panulirus laevicauda (Latreille)" (On the Biology of the Cape Verde Spiny Lobster Panulirus laevicauda--Latreille), by Petronio a Coelho; "Um metodo a experimentar no Nordeste: pescaria noturna com lampadas" (A Method of Experimenting in the Northeast: Night Fishing with Lights); "Experiencia de pesca com caiques na costa setentrional nordestina" (Experience with the Fishery with Small Boats--Experience of Long-Line Fishing Vessels Off Northwest Coast of Africa), by Melquiades Pinto Paiva; "Lagostas que ocorrem no Nordeste Brasileiro" (Spiny Lobsters Which Occur in the Brazilian Northeast), by Petronio A. Coelho; "Sobre o peso das lagostas capturadas em Pernambuco" (On the Weight of Spiny Lobsters Landed in Pernambuco); and "Equipamentos usados na pesca das lagostas na Australia" (Gear Used in Spiny Lobster Fishery in Australia).

CANADA:

The Canadian Fish Culturist, Issue 31, October 1962, 57 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Includes articles on: "Some Water Pollution Problems Connected with the Disposal of Pulp Mill Wastes," by Michael Waldichuk; "The Need and Value of Water Quality Criteria with Special Reference to Aquatic Life," by Clarence M. Tarzwell; and "The Salmon Fishery in Nova Scotia," by N. E. J. MacEachern and J. R. MacDonald

"Investigation and Management of Atlantic Salmon and Trout (Summary of 1961-62 Reports). Part 1--The Research Program; Part 2--The Management Program," articles, Trade News, vol. 15, no. 2, August 1962, pp. 3-17, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Part 1 gives an account of the extensive program of investigation of Atlantic salmon and trout in Eastern Canada. It covers catch statistics, availability of adults, production of young salmon, distribution and use of salmon of Miramichi origin, environmental changes, and physiological studies of salmon. It also covers results of brook and rainbow trout investigations--character of Maritime fresh waters, basic problems and experimental approach, annual fluctuations in standing crops of brook trout in a small stream, physical alterations of stream environments to improve brook trout production and utilization, yields of brood trout from natural and artificial recruitment, estuarial stocking of brook trout, and relative value of rainbow and brook trout in utilizing the productive capacities of Maritime fresh waters. Part 2 covers hatchery and pond operations, engineering service, biological service, adult salmon transfer, effect on salmon of new oil refinery and proposed new pulp mill, salmon net mesh experiment, river reconnaissance surveys, mine wastes disposal studies, exploits river development, lake investigations, fishway construction and remedial work, Placentia water supply, and the Indian River diversion project.

CAPELIN:

"Capelin and the Capelin Fishery," by Dag Moller and Steinar Olsen article, Fiskets Gang, vol. 48, January 18, 1962, pp. 27-36, printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Some Data on the Biology and Fishery of the Barents Sea Capelin, by Iu. Pozdniakov, 26 pp., printed. (Translated from the Russian, Regular Features in the Concentrations and Migrations of Commercial Fishes in the Murman Coastal Zone, and Their Relation to Biological, Hydrological and Hydrochemical Processes, 1958, pp. 150-175.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

CEPHALOPODS:

Brain and Behavior in Cephalopods, by M. J. Wells, 171 pp., illus., printed, $4.50. Stanford University Press, Stanford University, Calif.

CHESAPEAKE BAY:

Water Temperatures, Salinities, and Fishes Collected during Trawl Surveys of Chesapeake Bay and York and Pamunkey Rivers, 1956-1959, by William Henry Massmann, Special Scientific Report No. 27, 27 pp., printed. Virginia Institute of Marine Science, Gloucester Point, Va., 1962.

CHILE:

"Notas Preliminares Sobre la Fauna Marina Preabismal de Chile, con Descripcion de una Familia de Rayas, Dos Generos y Siete Especies Nuevos" (Preliminary Notes on the Deep Sea Marine Fauna of Chile, with Description of a Family of Rays, Two Generas, and Seven New Species), by Fernando de Buen, article, La Fauna Marina Preabismal de Chile, Bulletin, vol. 27, no. 3, pp. 171-201, printed in Spanish. Museo Nacional de Historia Natural, Santiago, Chile, 1959.

CHILLING OF FISH:

"Refrigeration Equipment Applied in the Mechanical Chilling of Fish During Transport," by A. W. Lantz (Fisheries Research Board of Canada), article, Progress Reports of the Biological Station and the Technological Unit No. 1, September 1959, pp. 38-40, printed. Fisheries Research Board of Canada, Biological Station, London, Ontario, Canada.

CLAMS:

Growth and Mortality Rates of the Razor Clam (SILIQUA PATULA) on Clatsop Beaches, Oregon, by George Hirschhorn, Contribution No. 27, 55 pp., illus., printed. Fish Commission Research Laboratory, Route 1, Box 31A, Clackamas, Oreg., June 1962. The areas most productive of the Pacific razor clam in Oregon are Clatsop Beaches, characterized by flat beach-face slope and small sand-size. They have supported commercial and sport clam fisheries for many years under regulations which provided until 1954 for a minimum size limit of 3.5 inches in commercial catches and a limit of 36 clams by recreational diggers. Neither fishery has been subject to seasonal restrictions at any time, nor to quota limitations. In this study a description of this fishery is attempted by estimating the rates of growth and mortality essential to the determination of optimum yields. Following validation of the ring method of age determination for Clatsop stocks, the seasonal variation in weight and linear growth is examined as well as variations in linear growth of clams between beaches. Mortality rates are estimated from a census on one of the smaller Clatsop Beaches in 1952 and 1953 which included the use of serially marked clams. Finally, potential yield is examined as a function of age at first capture.

"Reproducibility of the Most Probable Numbers Technique for Determining the Sanitary Quality of Clams," by Donald W. Lear (Chesapeake Biological Laboratory, Solomons, Md.), article, Applied Microbiology, vol. 10, January 1962, pp. 60-64, printed. Applied Microbiology, Williams and Wilkins Co., 428 E. Preston St., Baltimore 2, Md.

COD:

Further Studies on Vitamins and the Reproductive Cycle of Ovaries in Cod (GADUS MORRUHA), by Olaf R. Braekkan and Gjermund Boge, Fiskeridirektoratets Skrifter Serie Teknologiske undersokelser (Reports on Technological Research Concerning Norwegian Fish Industry), vol. 4, no. 2, 14 pp., illus., printed. A/S John Griegs Boktrykkeri, Bergen, Norway, 1962.

COMPOSITION:

"Elementary Composition of the Mineral Substance in Fish, Mollusk, and Crustacean Meat," by P. V. Kizevetter, article, Chemical Abstracts, vol. 55, March 20, 1961, 5799d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Inorganic Chemical Constituents in Sea Fish. IV--The Chemical Elements and Relative Quantities of Ca and P in Katsuwonus pelamis," by Noboru Imanishi (University of Kochi, Kochi, Japan), article, Chemical Abstracts, vol. 55, May 15, 1961, 9699f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Studies on the Chemical Composition of Muscle Tissue. I--The Muscles of the Hagfish, Myxine glutinos, and the Roman Eel, Muraena helena," by James D. Robertson (University of Glasgow, Glasgow, Scotland), article, Chemical Abstracts, vol. 55, May 29, 1961, 10727e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

CONNECTICUT:

Connecticut Boating Guide, 39 pp., illus., printed. Boating Safety Commission, Department of Agriculture and Natural Resources, Hartford, Conn. In 1961, the Connecticut General Assembly passed Public Act No. 506 concerning "The Registration of Motorboats" and Public Act No. 520 concerning "The Creation of a Boating Safety Commission and Establishing Boating Safety Regulations." According to the report, "These laws and the recent regulations promulgated by the Boating Safety Commission have been designed to be compatible with the Federal Boating laws in order that the boating public would not be subject to widely different requirements on Connecticut State or Federal waters. The growing popularity of boating and the resulting increase in water traffic make it imperative that each pleasure boat operator know and carefully observe these laws and regulations established to protect him and his neighbors using the waters of this State." The pamphlet contains the essential elements of the laws and regulations, digests of ordinances which were received and reviewed by the commission, and other helpful information for the benefit of the boat owner and operator.

DEODORIZATION:

"Deodorization of Marine Animal Oil, and Properties of the Deodorized Oil," by T. Tsuchiya and T. Tanaka,

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article, Chemical Abstracts, vol. 56, April 2, 1962, 7453g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Removal of the Fishy Odor from Whale Oil by High-Frequency Current," by T. A. Khorin (Fat-Combine, Troitsk, U. S. S. R.), article, Chemical Abstracts, vol. 55, October 2, 1961, 20461g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

DIRECTORIES:

Fisheries Year-Book and Directory, 1962, 486 pp., illus., printed in English with French summary, British-Continental Trade Press Ltd., 222 Strand, London, England. Includes articles on the British fishing industry, Icelandic fisheries and exports, the fishing industry of the Federal Republic of Germany, Soviet production and plans, United States fisheries, the fishing industry around the world, progress in fish freezing, and the problems of the fish frier. Also covers international index of fish containers, fish supply calendar, dictionary of fish names, organizations and trade associations, trade journals, preservation of fish, world fishery research, accelerated freeze-drying, byproducts plant on board ship, fishing vessel design and construction, and fishing vessels completed or on order. The directory section contains names and addresses of exporters, producers, and trawler owners; importers and wholesalers; fish canners and bottlers; manufacturers of machinery and equipment for fish processing and refrigeration; producers of packing machinery and materials; suppliers for fisheries; manufacturers of fishery byproducts; cold storage and transport operators; and classified list of advertisers.

Marine Digest Pacific Northwest Maritime Directory and World-Wide Shipping Guide, 1962, 393 pp., illus., printed, $2. Marine Digest Publishing Company, 79 Columbia St., Seattle 4, Wash., 1962. The world-wide shipping guide of steamship services from Washington, Oregon, and British Columbia areas lists ports alphabetically in the region of the world where they are situated. Under each port are the lines that maintain a service into that port from the Pacific Northwest. In the directory, key personnel of leading companies are cross-indexed. The directory covers the Washington ports of Seattle, Tacoma, Olympia, Gray's Harbor, Willapa Harbor, Longview, Vancouver, Port Angeles, Everett, Anacortes, and Bellingham; Oregon ports of Portland, Astoria, and Coos Bay; and British Columbia ports of Vancouver, New Westminster, Victoria, Nanaimo, Alberni, Chemainus, Courtenay-Campbell River, and Vancouver Island. Also includes a marine buyers' guide which lists alphabetically a number of products and services.

DOGFISH:

"Dogfish Gelatin," by Shirley E. Geiger, Eve Roberts, and N. Tomlinson (Fisheries Research Board of Canada Technological Station, Vancouver, British Columbia), article, Journal of the Fisheries Research Board of Canada, vol. 19, March 1962, pp. 321-326, printed. Fisheries Research Board of Canada, Biological Station, London, Ontario, Canada.

DOMINICAN REPUBLIC:

Comercio Exterior de la Republica Dominicana, vol. 9, nos. 10-12, October-December and Annual Summary, 1961, 262 pp., illus., printed in Spanish. Direccion General de Estadistica y Censos, Santo Domingo, Dominican Republic, 1962. A considerable amount of data on imports and exports of fishery products is included.

EELS:

Studies on Fishes of the Family Ophidiidae. IV--Two New Dwarf Cusk-Eels (Genus OPHIDION) from the Tropical Western Atlantic, by C. Richard Robins and James E. Bohlke, Contribution No. 240, 9 pp., illus., printed. (Reprinted from Notulae Naturae, no. 325, 1959.) Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla., 1959.

ETHIOPIA:

Marine Fisheries in the Area of Massawa, 1954 Eth. Cal., in Figures, Fisheries Information Leaflet No. 2, 5 pp., processed. Fisheries Division, Department of Marine, Ministry of National Defense, Imperial Ethiopian Government, Massawa, Ethiopia, October 25, 1962. Covers the fishing activities along the continental coast from Ras Kassar in the North (Sudan Border) to Thio in the South, including the inshore waters, outlying islands, and the offshore fishing grounds. Presents statistical tables giving data on fishing craft, persons employed in the fisheries, fishery products landings, volume and value of exports, sales of fresh fish in Ethiopia, landings of fresh fish by fishing method, and other related data. Most data are for July 1, 1961-August 31, 1962 (1953-1954 Ethiopian Calendar).

FISH BEHAVIOR:

The Leaping Behaviour of Salmon and Trout at Falls and Obstructions, by T. A. Stuart, Freshwater and Salmon Fisheries Research 28, 46 pp., illus., printed, $4. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., 1962. Laboratory and field observations and experiments conducted during this study showed that the behavior of migrating salmonids, both adult and juvenile, when faced with a barrier or obstruction, can be correlated directly with the hydraulic conditions in the river channel. The problem of the passage of migratory salmonids over artificial obstructions is discussed and experiments are described which suggest that the provision of the normal contours of a natural river channel bed would facilitate the passage of both upstream and downstream migrants by reproducing hydraulic phenomena to which they are adapted.

FISH COOKERY:

Northwest Seafood Favorites, by Inez M. Eckblad, Extension Circular 329, 10 pp., processed. Extension Service, Institute of Agricultural Sciences, Washington State University, Pullman, Wash., April 1962. Presents recipes and tips for serving Pacific Coast fish and shellfish. Includes directions for preparing salmon baked in the sand, outdoor barbecue for a crowd, fish in foil, barbecued clams or oysters, pan roast oysters, clam chowder, baked fish, and other delicacies.

FISH CULTURE:

Fish Culture in Maine, by Stanley P. Linscott and David O. Locke, 16 pp., illus., printed. Maine Department of Inland Fisheries and Game, Augusta, Me., 1962. Discusses the history of fish culture; sources of fish eggs; egg taking; incubation of fish eggs; foods

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and feeding; sanitation and diseases; and distribution of small fish. Also discusses kinds of fish raised--landlocked salmon, brook trout, lake trout, and brown trout; and warm-water fish stocking.

"Perspectives et Interets de la Rizipisciculture a Madagascar" (Prospects and Interests of the Rice-Fish Culture of Madagascar), by A. Kiener, article, Bulletin de Madagascar, vol. 12, no. 197, October 1962, pp. 883-902, illus., printed in French. M. le Directeur del'Imprimerie nationale, Tananarive, Malagasy Republic.

FISH MANAGEMENT:

Status of Our Knowledge of Managing Stream Fish in West Virginia, by Elwood Armstrong Seaman, Publication No. 4, 23 pp., printed. Division of Fish Management, Conservation Commission of West Virginia, Charleston, W. Va., 1952.

"The Use of Electricity in Fish Management in Pennsylvania," by Jack G. Miller, article, Pennsylvania Angler, vol. 31, no. 10, October 1962, pp. 4-8, illus., printed, single copy 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa. Discusses in some detail the use of both alternating and direct current electricity to stun fish temporarily so that they may be handled by fishery biologists.

FISH MEAL:

Biological Value and Amino Acid Composition of Fish Meals, by S. G. Wiechers and Henriette Laubscher, Progress Report No. 62, 18 pp., printed. Fishing Industry Research Institute, University of Cape Town, Rondebosch, C. P., South Africa Republic.

FISH OIL:

"Toxicity of Fish Oil. X--Toxicity of Rapeseed Oil Polymerized by Heating in Air," by Noboru Matsuo (Seikei University, Tokyo, Japan), article, Chemical Abstracts, vol. 55, February 6, 1961, 2825a, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

FOOD AND AGRICULTURE ORGANIZATION:

Fish in Nutrition, edited by Eirik Heen and Rudolph Dreuzer, 464 pp., illus., printed, $19. Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London EC4, England, 1962. The first International Conference on Fish in Nutrition, organized by the Food and Agriculture Organization (United Nations), was held in Washington, D. C., September 19-27, 1961. It was attended by over 300 participants from 34 countries and international organizations. This book embodies the important original review papers contributed by 33 scientists distinguished in their special fields of work, supported by some 35 scientific and technical contributions (given in condensed form) presented by other writers--all with abstracts in French and Spanish. These papers are supplemented by reports of the discussions that ensued following the presentation of the papers at their respective sessions of the conference. The contents of the book are divided into five parts. Part I covers the role of fish in world nutrition and includes articles on the aquatic biomass, the world biomass of marine fishes, importance of fisheries production and utilization, role of fish in human nutrition, and role of fish for animal feeding. Part II discusses chemical components of fish and their changes under treatment, and is dealt with in three main sections: (1) protein and general composition; (2) lipids and vitamins; and (3) the influence of processing methods. Part III covers the contribution of fish and fishery products to national diets and includes sections on: (1) proteins; (2) lipids; and (3) trace elements and their importance. Part IV discusses fish and fishery products in animal nutrition and includes papers on the nutritional value of fish and fish products for ruminants, for pigs, for poultry, and for fur-bearing animals. Part V covers demand for fish as human food and possibilities for increased consumption with emphasis on the value of fish flour and technical logical developments in connection therewith.

Indo-Pacific Fisheries Council Proceedings, 9th Session, Karachi, Pakistan, 6-23 January, 1961, Section II--Technical Papers; Section III--Symposium, 262 pp., illus., printed, $1. IPFC Secretariat, FAO Regional Office for Asia and the Far East, Bangkok, Thailand, 1962.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of the West Indies Federation on Fishing Boats, by Kjeld Rasmussen, FAO Report No. 1409, 42 pp., illus., 1961.

Report to the Government of Cyprus on Fishery Development Possibilities, by V. Fodera, FAO Report No. 1436, 86 pp., and map, illus., 1961.

Third Report to the Government of India on the Pearl and Chank Beds in the Gulf of Manaar, by Francesco Baschieri-Salvadori, FAO Report No. 1498, 10 pp., 1962.

Supplement to Report to the Government of India on the Improvement of Fishing Techniques in Inland Reservoirs, by S. B. Gulbadamov, FAO Report No. 1499, 60 pp., illus., 1962.

Report to the Government of Syria on a Fish Culture Project, by Dietmar R. Riedel, FAO Report No. 1502, 41 pp., 1962.

FOREIGN TRADE:

"The Trade Expansion Act of 1962," by Leonard Weiss, article, The Department of State Bulletin, vol. 47, no. 1223, December 3, 1962, pp. 847-851, printed, single copy 25 cents. Bureau of Public Affairs, U. S. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

FRANCE:

Bulletin Officiel d'Information du Conseil Superieur de la Peche, no. 49, July-August-September 1962, 112 pp., illus., printed in French, single copy 1.5 NF (about 30 U. S. cents). Bulletin Officiel d'Information du Conseil Superieur de la Peche, 6, place de la Visitation, Angers, France. Includes, among others,

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these articles: "Problemes poses par la pollution des eaux" (Problems Posed by Water Pollution), by Prat and Vivier; "Traitement de la maladie infectieuse des carpes d'elevage en etang" (Treatment of the Infectious Disease of Carp Reared in Ponds); by M. A. Wurtz; and "Poissons et crustaces d'eau douce acclimates en France en eaux libres depuis le debut du Siecle" (Fresh-Water Fish and Crustaceans Introduced into Public Waters of France since the Beginning of the Century), by Paul Vivier.

FREEZE-DRYING:

Convention in Cologne on Dry Freezing: Dry Freezing of Food, by A. S. Kovacs Hamburg, ACSI I-1430-B, ID 2198556, 6 pp., processed. (Translated from the German, Die Ernahrungswirtschart, no. 3, 1962, pp. 107-111.) Office of Technical Services, U.S. Department of Commerce, Washington 25, D. C.

FRESH-WATER FISHERIES:

A Collection of Six Short Articles Specially Written for Freshwater Fishermen, Circular No. 3, 24 pp., printed. Fisheries Research Board of Canada, Biological Station and Technological Unit, London, Ontario, Canada, 1961.

A Collection of Three Articles Specially Written for Freshwater Fishermen, Circular No. 4, 30 pp., printed. Fisheries Research Board of Canada, Biological Station and Technological Unit, London, Ontario, Canada, 1962.

FROZEN FISH:

"Protein Denaturation in Frozen Fish. IV--Opacity Measurements on the Muscle," by R. M. Love (Torry Research Station, Aberdeen, Scotland), and "V--Development of the Cell Fragility Method for Measuring Cold-Storage Changes in the Muscle," by R. M. Love and Eleanor M. Mackay, articles, Journal of the Science of Food and Agriculture, vol. 13, March 1962, pp. 197-212, printed. The Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

FROZEN FOODS:

"Association of Food and Drug Officials of the United States Model Frozen Food Handling Code," article, Frosted Food Field, vol. 35, no. 4, October 1962, pp. 50-51, 57-59, printed, single copy $1. Frosted Food Field, Inc., Suite 51, 321 Broadway, New York 7, N.Y. The AFDOUS Code has served as the model for frozen food handling legislation in Connecticut, Illinois, and Pennsylvania and is also being used as the basis for legislation being prepared in Maryland. Defining handling practices from plant to retail outlet, the Code will serve increasingly as a reference to both public health officials and the industry itself. The Code, the complete text of which is reproduced in the article, contains definitions of terms, requirements for frozen foods, construction and layout of frozen food plants, and design and construction of frozen food processing equipment. Also included are operating practices for the commercial manufacture of frozen foods, requirements for transportation of frozen products, warehousing requirements, and instructions for handling by retail outlets.

"Distributor Sales to Volume Feeders Rise," article, Frosted Food Field, vol. 35, no. 4, October 1962, pp. 28, 33, printed, single copy $1. Frosted Food Field, Inc., Suite 51, 321 Broadway, New York 7, N. Y. Frozen food distributors sold a greater volume of product to volume feeding outlets in 1962 than at any time previously. They expect to sell them even more in the year ahead. Certain categories of frozen foods are growing in institutional sales much more rapidly than others. Sales of fish and shellfish and of frozen vegetables in particular showed more rapid increase than any others. These, as well as other facts emerge from responses of 45 frozen food distributors, chosen at random, to a recent survey. This survey was designed to spot trends in institutional distribution of frozen foods. Frozen fish and shellfish lead by far, with nine of the distributors stating that this product grouping grew more rapidly than any other, and three others stating that it showed the second sharpest growth.

"Frozen Food All-Industry Coordinating Committee Voluntary Operating Practices," article, Frosted Food Field, vol. 35, no. 4, October 1962, pp. 60-61, printed, single copy $1. Frosted Food Field, Inc., Suite 51, 321 Broadway, New York 7, N. Y. These Voluntary Operating Practices, the complete text of which is reproduced in the article, were drawn up and approved by the members of the Frozen Food All-Industry Coordinating Committee. They have been designed to allow the industry to improve its handling practices without governmental intervention. Calling for increasingly stringent temperature goals, the Practices are set up so that each segment of the industry, by refusing to accept shipments above specified temperatures, in effect polices others. The practices were approved and signed by eight national frozen food industry trade groups. Included in this article are requirements of frozen foods, warehouse equipment, warehouse handling practices, and transportation equipment. Also covered are handling practices for over-the-road transportation, handling practices for route delivery, equipment for retail stores, and retail handling practices.

GEAR:

"New Otter Boards 'Akula-2'," by E. Iu. Ianson and S. A. Minovich, article, Rybnoe Khoziaistvo, vol. 36, 1960, pp. 25-33, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

GENERAL:

Shore and Sea Boundaries, by A. L. Shalowitz, Publication 10-1, 444 pp., illus., printed $3.50. Coast and Geodetic Survey, U. S. Department of Commerce, Washington, D. C., 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) The first of a two-volume documented treatise on the engineering and legal aspects of shore and sea boundaries, with special reference to the use and interpretation of Coast and Geodetic Survey data. Deals with the boundary problems associated with the Supreme Court decisions in the "tidelands" cases, and with the 1958 Geneva Conventions on the Law of the Sea and provides a technical and legal background for the delimitation and demarcation of water boundaries, particularly those determinded by tidal definition. Subjects covered include, among others, the inland waters problem, the offshore islands problem, the tidal boundary problem, Federal-state jurisdiction under the Submerged Lands Acts, the continental shelf doctrine in the international

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law of the sea, and interpretation of the boundary provisions of the United Nations Convention on the Territorial Sea and the Contiguous Zone.

GREAT LAKES:
Exploration of Collateral Data Potentially Applicable to Great Lakes Hydrography and Fisheries, by Charles F. Powers, David L. Jones, and John C. Ayers, 159 pp., illus., printed. Great Lakes Research Institute, University of Michigan, Ann Arbor, Mich., 1958.

GULF OF MEXICO:
"New Records and Notes on Fishes from the North-Central Gulf of Mexico," by C. E. Dawson, article, Copeia, no. 2, July 20, 1962, pp. 442-444, printed, single issue $2.50. The American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

HERRING:
"Volumetric Determination of Oxidative Stability of Salt Herring," by R. Marcuse and N. Knutsen, article, Chemical Abstracts, vol. 54, July 10, 1960, 13483e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

HONDURAS:
Establishing a Business in Honduras, by William Frohlich and Frederick J. Tower, WTIS Part 1, Economic Report No. 62-73, 16 pp., printed, 15 cents. Bureau of International Programs, U. S. Department of Commerce, Washington 25, D. C., September 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Covers Government policy on investment; repatriation of capital; trade factors in investment; business organization; patents, trademarks, copyrights; regulations affecting employment, and sources of Government revenue.

INDIA:
7th Annual Report of the Gujarat Fisheries Central Co-Operative Association Limited, 1961-62, 52 pp., illus., printed. The Gujarat Fisheries Central Co-Operative Association Ltd., 'Shivprasad,' 7, Hindu Colony, Opp. Sardar Patel Stadium, Navrangpura, Ahmedabad 9, India. Covers activities of the association, including expansion of fresh fish trade, better prices for fishermen, promotion of ethical trade practices, supplying of gear and equipment to fishermen, administration of Government loans and subsidies, and other related information. It also contains information on the program for 1962-63, and on the financial situation of the Association.

INTERNATIONAL COMMISSIONS:
(North Pacific Fur Seal Commission) Proceedings of the Fifth Annual Meeting, February 7-February 9, 1962, Ottawa, Canada, 36 pp., processed. Secretary, North Pacific Fur Seal Commission, U. S. Fish and Wildlife Service, Washington 25, D. C., September 1962. The North Pacific Fur Seal Commission was established in January 1958, during a meeting held in Washington, D. C. The Commission was organized pursuant to the Interim Convention on Conservation of North Pacific Fur Seals, signed in Washington, D. C., on February 9, 1957, by the Governments of Canada, Japan, the U.S.S.R., and the United States. The Convention came into force on October 14, 1957. This report contains a summary of the proceedings of the Fifth Annual Meeting, a report of the Standing Scientific Committee, a list of participants attending the meeting, administrative report of the Secretary to the Fifth Meeting, and summaries of fur-seal investigations during 1961 and plans for fur-seal investigations during 1962.

IRELAND:
Programme of Sea Fisheries Development, 11 pp., printed, 1s. 6d. (about 20 U. S. cents). Government Publications Sale Office, G. P. O. Arcade, Dublin 1, Ireland, 1962. Outlines the intensified development program for the Irish sea fisheries in the fields of training of fishermen and skippers, Government assistance in vessel financing and construction, and construction of fishery harbors. Also covers processing of fishery products, marketing of fish, expanded functions of the Irish Sea Fisheries Board, and investigation and research projects.

IRRADIATION:
"Gamma Irradiation Installations and Research into Food Preservation by Gamma Irradiation at the Belgian Centre d'Etude de l'Energie Nucleaire," by M. De Proost (Centre d'Etude de l'Energie Nucleaire-C.E.N.--Mol, Belgium), article, Food Irradiation Quarterly International Newsletter, vol. 2, July-September 1961, pp. A2-A5, printed. Interdepartmental Committee on Radiation Preservation of Food, U. S. Department of Commerce, Washington 25, D. C.

Investigation of the Surface Pasteurization, by Means of Soft X-Rays, of Packed Samples of Fish and Meat Containing Inner Bacteria, by A. Schmidt-Lorenz and A. Berger, AEC Tr-5096, 17 pp., processed. (Translated from the German, International Journal of Applied Radiation and Istopes, vol. 11, 1961, pp. 161-173.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

"Studies on the Browning of Irradiated Fish. I--Effect of Presence of Free Sugar on the Browning of Fish Flesh," by K. Yamada and K. Amano, article, Bulletin of the Tokai Regional Fisheries Laboratory, no. 27, 1960, pp. 47-53, printed. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku Tokyo, Japan.

ITALY:
"Feudal Fish in Sardinia," article, The Economist, vol. 204, no. 6209, August 25, 1962, pp. 704-705, illus., printed, single copy 1s. 6d. (about 20 U. S. cents). The Economist, 22 Ryder St., St. James's, London SW1, England. Discusses the struggle of the feudal owners and the coastal fishermen for fishing rights in the lagoon at Cabras--a lake divided from the sea by a narrow strip of land cut by canals.

IVORY COAST:
"L'industrie des Peches en Cote d'Ivoire et ses perspectives d'avenir" (The Ivory Coast Fisheries Industry and Its Prospects for the Future), article, Bulletin Mensuel, no. 11, November 1962, pp. 5-11, processed in French. Chambre de Commerce de la Republique de Cote d'Ivoire, Abidjan, Ivory Coast.

KOREA REPUBLIC:
Annual Report for Fishery Products Inspection, 161 pp., illus., printed in Korean with some English transla-

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tions. Central Fisheries Inspection Station, Ministry of Agriculture and Forestry, 103 Wonnam-Dong, Chong-Ro, Seoul, Korea, 1961. Contains a general review of the inspection of fishery products in Korea, the present status and results of fishery inspection, and related subjects.

MARKETING:

"The Marketing of Quick-Frozen Fish," by A. Kiener, article, Revue Generale du Froid, vol. 38, January 1961, pp. 37-41, printed in French. Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris VI, France.

MISSISSIPPI:

The Status and Future of the Mississippi Marine Fishery Industry (Special Committee on Economic Blueprint, Mississippi Economic Council), by G. Gunter, W. J. Demoran and H. Hague, 18 pp., processed. Gulf Coast Research Laboratory, Ocean Springs, Miss., 1962.

NETHERLANDS:

Jaarcijfers over de Visserij Gedurende het Jaar 1961 (Annual Fisheries Statistics, 1961), 167 pp., illus., printed in Dutch with summaries in English, and statistical tables in both Dutch and English. Directie van de Visserijen, 's-Gravenhage, Netherlands, May 1962. Presents information on sea, inshore, and river and inland fisheries; government regulations pertaining to the fisheries; whaling; export of salted and smoked herring; fisheries research; and fishing vessels. Contains statistical tables giving data on number and tonnage of vessels, quantity and value of marine fish and shellfish landings, salted herring exports, and other related information.

NETS:

"Colour--Fishability. IV.," by G. Molin, article, Ostkusten, vol. 33, 1961, pp. 21-25, printed in Swedish. Ostkusten, Svenska Ostkustfiskarenas, Centralforbund, Hudiksvall, Sweden.

Fixed and Drift Nets, by F. Baranov, 33 pp., printed. (Translated from the Russian, Theory and Calculation of Fishing Gear, Chap. 8, pp. 220-255.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England, 1962.

NORTHERN RHODESIA:

Game and Fisheries Annual Report for the Year 1961, 34 pp., illus., printed, 2s. 6d. (about 21 U. S. cents). The Government Printer, Lusaka, Northern Rhodesia, 1962. The section on fisheries discusses fisheries research, work in fisheries development, progress in fresh-water fisheries in the Northern and Southern areas, accomplishments in fish farming, fishery investigations, and extension work. Also included is a report by the Chief Fisheries Research Officer covering activities of the organization, and the research program.

NORWAY:

Statistisk Arbok for Norge, 1962 (Statistical Yearbook of Norway, 1962), Norges Offisielle Statistikk XII 87, 367 pp., printed in Norwegian and English. Statistisk Sentralbyra, Oslo, Norway, 1962. Includes, among others, a chapter on fishing, sealing, and whaling. It presents statistical tables giving data on fishermen and fishing craft, by counties; vessels by length, type, and counties; fishing gear, by type and material; quantity and value of the fisheries; quantity and value of principal species; production of principal fishery products; landings of seals; landings of whales; and other related data. Most of the latest data are for 1960 with some for 1961.

OCEANOGRAPHY:

Conference on Oceanographic Instruments and Other Articles, by N. N. Sysoev, Trans-124, 69 pp., illus., printed. (Translated from the Russian, Biulleten' Okeanograficheskoi Komissii pri Prezidiume Akademii Nauk SSSR, no 4, 1960, 68 pp.) U. S. Navy Hydrographic Office, Washington, D. C., 1962.

National Oceanographic Program, Fiscal Year 1963, ICO Pamphlet No. 3, 32 pp., illus., processed, limited distribution. Interagency Committee on Oceanography, Rm. 1714, Bldg. T-3, 17th St. and Constitution Ave. NW., Washington, D. C., April 1962. Preparation of the annual National Oceanographic Program is the responsibility of the Interagency Committee on Oceanography of the Federal Council for Science and Technology, and the report is issued each spring. In preparing this plan the Committee is charged with coordinating and stimulating work in the marine sciences by all interested Federal agencies in order to meet the national goals set by the President. The Fiscal Year 1963 program represents not only a consolidation of mission-oriented agency plans, but also a cooperative blending of independent efforts toward the achievement of common goals. The program represents, within restrictions of time, money, and manpower, a plan for maximum exploitation of the sea in man's interest. The present report contains a summary of Fiscal Year 1962 program activities, outlines the National Oceanographic Program for Fiscal Year 1963, and presents budget summaries. Also included is a report on the International Indian Ocean Expedition, in which the United States participates.

Proceedings Government-Industry Oceanographic Instrumentation Symposium, 505 pp., illus., printed, $5. Miller-Columbian Reporting Service, 931 G St. NW., Washington 1, D. C. The Government-Industry Oceanographic Instrumentation Symposium, held at Washington, D. C., August 16-17, 1961, was sponsored by the Interagency Committee on Oceanography of the Federal Council for Science and Technology. The proceedings include the 25 papers presented by administrators and scientists, answers by panel members to questions received from the floor, lists of the scientific and industrial laboratories concerned with oceanographic research and development, lists of instrumentation developments now required for oceanographic survey and research, and other miscellaneous information. According to the report, "A major requirement for the necessary growth in oceanography is the availability of reliable, precise, and easily-used instruments to record the parameters of the oceans. A great movement is now under way to introduce new devices and modern techniques into this field. The entire ocean floor, three-quarters of the earth's surface, must be mapped in topographic and geological detail. The conditions affecting the transfer of sound must be known in general principle and in specific local detail. The earth's heat budget and energy transfers from the atmosphere to the water

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must also be defined. The range of the animals and plants in the sea and the extent and nature of the environment affecting the individual species must be understood if they are to be harvested efficiently, and if the farming of the sea is to become an accomplished fact. Rock specimens, cores, deep drilling, and the strata of the ocean bottom must be plotted if we are to use the sea's mineral resources. Many of the instruments to do these tasks have been invented; many have not yet been conceived; some are still in the predevelopment stage and much refinement needs to be done to make them generally applicable. The instrument needs for the rapidly expanding National Oceanographic Program were comprehensively outlined in the two-day Symposium. Industry was invited to assume an ever-increasing responsibility in this field."

OYSTERS:

Oyster Mortality Studies in Virginia. III--Epizootiology of a Disease Caused by HAPLOSPORIDIUM COSTALE, Wood and Andrews, by Jay D. Andrews, John L. Wood, and H. Dickson Hoese, Contribution No. 115, 17 pp., illus., printed. (Reprinted from Journal of Insect Pathology, vol. 4, no. 3, September 1962, pp. 327-343.) Virginia Institute of Marine Science, Gloucester Point, Va.

"Oysters--a Delicacy from the Cradle of the Sea," by Harold F. Udell, article, The Conservationist, October-November 1962, pp. 9-11, illus., printed, single copy 50 cents. The Conservationist, Rm. 335, State Campus, Albany, N. Y. Covers the use of oysters by the ancient Romans, the history of the New York oyster fishery, anatomy and reproduction, growth and development of young oysters, and their feeding habits.

"Studies on the Application of Dehydrogenating Reaction to Evaluate the Effects of Industrial Wastes on Oysters," by Masaru Fujiya, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 26, October 1960, pp. 974-980, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

PERU:

"El Paiche"; Aspectos de su Historia Natural Ecologia y Aprovechamiento (Aspects of Its Natural History, Ecology, and Development), by Jorge Sanchez Romero, 48 pp., illus., printed in Spanish. Servicio de Pesqueria, Ministerio de Agricultura, Lima, Peru, 1961.

La Pesca en 1961 (The Fishery in 1961), by Javier Iparraguirre Cortez, Serie de Divulgacion Cientifica 18, 44 pp., illus., printed in Spanish. Departamento de Economia Pesquera, Ministerio de Agricultura, Lima, Peru.

PLANKTON:

Gear Data Report from Atlantic Plankton Cruises for the R/V "Pathfinder," December 1959-December 1960, by J. J. Norcross, W. H. Massmann, and E. B. Joseph, Special Scientific Report No. 19, 1 vol., printed. Virginia Fisheries Laboratory, Gloucester Point, Va.

POISONOUS SHELLFISH:

"Biochemical Studies on Paralytic Shellfish Poisons," by Edward J. Schantz (U. S. Army Chemical Corps, Fort Detrick, Md.), article, Chemical Abstracts, vol. 55, September 4, 1961, 17917i, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

POLLUTION:

Pollution-Caused Fish Kills, January-June, 1962, 4 pp., processed. Basic Data Branch, Division of Water Supply and Pollution Control, Public Health Service, U. S. Department of Health, Education, and Welfare, Washington 25, D. C., September 1962.

PORTUGAL:

Estatistica Industrial 1961 (Industrial Statistics 1961), 329 pp., printed in Portuguese and French. Instituto Nacional de Estatistica, Lisbon, Portugal, October 1962. Includes a section of statistical tables on various aspects of the Portuguese fisheries.

Madreporaires (White Coral), by Lucia Rossi, 13 pp., illus., printed in Portuguese. (Translated from French, Resultats Scientifiques de la Campagne du N. R. P. "Faial" dans les Eaux Cotieres du Portugal, no. 3, 1957.) Gabinete de Estudos das Pescas, Lisbon, Portugal, 1960.

QUALITY:

"Methods for Determining Freshness of Fish," by Yu. A. Puidak, article, Proceedings of the Third Scientific Conference on Infectious and Invasive Diseases of Farm Animals (5-7 March 1957), OTS 61-31213, pp. 42-44, processed, 75 cents. (Translated from the Russian, Materialy 3-i Nauchnoi konferentsii po infektsionnym i invazionnym zabolevaniyam sel'skokhozyaistvennykh zhivotnykh, Moscow, 1957.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1962.

"Microelectrophoresis for the Estimation of Quality of Marine Fish," by H. Hutten (Municipal Veterinary Research Bureau, Nebenstelle, Cuxhaven, Germany), article, Chemical Abstracts, vol. 54, August 25, 1960, 16685i, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

SALMON:

Alaska Salmon Management, by William F. Royce, 4 pp., illus., printed. (Reprinted from Western Fisheries, July 1961.) Western Fisheries, Roy Wrigley Corporation, Publications Ltd., 1104 Hornby St., Vancouver, B. C., Canada.

Furunculosis in Kelts, by Isabel W. Smith, Freshwater and Salmon Fisheries Research 27, 12 pp., illus., printed, 6s. (about 85 U. S. cents). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1962.

Salmon Migrations in Southeastern Alaska, by Wallace H. Noerenberg, Contribution No. 14, 6 pp., illus., printed, School of Fisheries, University of Washington, Seattle, Wash., 1958.

SANITATION:

Sanitary Regulations for Fish and Fish Products, OECD Documentation in Food and Agriculture No. 51, 186 pp., printed, $1.50. O.E.C.D. Regional Office, Suite 1223, 1346 Connecticut Ave. NW., Washington 6, D. C., 1961. A detailed study of the regulations used by OECD member governments to exercise control over health and sanitary factors in the production of fishery

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products. The OECD instituted the study by investigating the sanitary regulations for fishery products in force in the United States, Canada, and the 18 European nations in the Organization for Economic Cooperation and Development. In 1960, a special consultant was hired to conduct the study. In December 1961, experts from the member countries held a meeting to examine the consultant's draft report; to analyze the scientific, technical, and economic factors which have been responsible for the establishment of the sanitary regulations now in force in member countries; and to determine the practical measures to be taken to establish uniform standards of quality that would be accepted by them. These data presented at the meeting, including the consultant's report and the conclusions and recommendations of the expert, are included in the report.

SARDINES:

The Pilchard of South West Africa (SARDINOPS OCELLATA), Age Composition of SARDINOPS OCELLATA in the Commercial Catches of 1958 and 1959 with Reference to a Change in Rate of Growth, by O. Nawratil, Investigational Report No. 6, 31 pp., illus., printed. Secretary for South West Africa, Windhoek, South West Africa, 1962. This is a further paper in a series dealing with the general biology of the South-West African pilchard, Sardinops ocellata, and is a study of the age composition of fish in commercial catches made off Walvis Bay during the period 1958 and 1959. The slower rate of growth of fish of certain year classes caught in 1958 and 1959 received special attention. Samples of 6,950 and 6,550 fish were taken in 1958 and 1959, respectively, and age-determinations were done on key samples of 1,074 fish in 1958 and on 870 fish in 1959.

Prospectus--World Distribution of Sardines, World Scientific Meeting on the Biology of Sardines, Rome, September 21-28, 1959, 13 pp., processed. Food and Agriculture Organization of the United Nations, Rome, Italy.

Standardization of Biometric and Observation Methods for Clupeidae (Especially SARDINA PILCHARDUS) Used in Fisheries Biology, GFCM Studies and Reviews No. 1, 47 pp., illus., processed. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Rome, Italy, 1957.

SEA MAMMALS:

The Netting of Sea Mammals. A Report on the Belcher Island Expedition, 1960, by I. A. McLaren and A. W. Mansfield, Circular No. 6, 13 pp., printed. Fisheries Research Board of Canada, Arctic Unit, Montreal, Canada, 1960.

SEA STAR:

A Note on the Feeding Habits of the West Indian Sea Star ORESTER RETICULATUS (Linnaeus), by Lowell P. Thomas, Contribution No. 277, 2 pp., printed. (Reprint from Quarterly Journal of the Florida Academy of Science, vol. 23, no. 2, 1960, pp. 167-168.) Quarterly Journal of the Florida Academy of Sciences, University of Florida, Gainsville, Fla.

SHRIMP:

"Estimating a Population of Shrimp by the Use of Catch per Effort and Tagging Data," by E. S. Iversen, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 12, no. 3, 1962, pp. 350-398, illus., printed, single copy $2. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla.

SIERRA LEONE:

Basic Data on the Economy of Sierra Leone, by James D. Bartlett, WTIS Part 1, Economic Report No. 62-80, 12 pp., illus., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C.) Covers general information, structure of the economy, agriculture, forestry, mining, industry, and power. Also discusses transportation, communications, finance, foreign trade, the program for economic development, marketing, and Government representation. A section of fishing covers attempts of the Government to develop inshore fishing, the consumption of fishery products, and possibilities of developing deep-sea fishing. Included are statistical tables showing quantity and value of Sierra Leone's imports and exports.

SMALL BUSINESS MANAGEMENT:

Color Can Stimulate Sales, by Ernest Dichter, Small Marketers Aid No. 85, 4 pp., processed. Small Business Administration, Washington 25, D. C. Color is a tool which small businessmen can use to increase sales to customers who look for taste and imagination when buying. The leaflet points out that people are unconsciously influenced by color. They are attracted by certain colors and repelled by others. The leaflet shows example of how various marketers use color in their selling. Some use color in sales tickets and wrappings, others in the store itself, and still others inject color into their direct mail advertising.

Export Trade and the Small Manufacturer, by Joseph P. McKenna and Stanley E. Boyle, Management Research Summary, 4 pp., processed. Small Business Administration, Washington 25, D. C., August 1962. Participation in export trade appears to depend primarily on the products and not on the size of the firm, according to the report. It was found that the number of firms engaged in export trade ranged from 4 percent of the smallest firms to 17 percent of those with more than 100 employees. The outstanding problem for most of the firms was lack of information about foreign markets, export procedures, and other topics.

Federal Handbook for Small Business--A Survey of Small Business Programs in the Federal Government Agencies, 108 pp., illus., processed. Small Business Administration, Washington 25, D.C., 1962. A handbook for small businessmen, comprising a survey of small business programs in the Federal Government Agencies. The publication of the handbook was sponsored jointly by the Senate Small Business Committee, the House Small Business Committee, the White House Committee on Small Business, and the Small Business Administration. Its purpose is to provide in one comprehensive volume information on all the Federal programs of interest to small business. Each agency of the Federal Government (including the Bureau of Commercial Fisheries) which has some program beneficial to small busi-

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ness firms has participated in the preparation of the data for the handbook.

Pricing Decisions in Small Business, by W. Warren Haynes, Management Research Summary, 4 pp., processed. Small Business Administration, Washington 25, D. C., August 1962. Points out that it is more important to develop sound reasoning about prices than to adopt specific rules, because reasoning adjusts more readily to differing or changing circumstances. A reasoned approach to pricing involves a comparison of the effects of a price decision on total revenue, or sales receipts, and on total costs.

SOUTH AFRICA REPUBLIC:
Department of Nature Conservation, Report No. 18, 1961, 114 pp., illus., printed. Department of Nature Conservation, Provincial Administration of the Cape of Good Hope, Cape Town, Republic of South Africa. This report covers the activities of the Department of Nature Conservation for 1961. It includes, among others, a section on the Division of Inland Fisheries which discusses the two Government hatcheries, stocking of public waters, tidal waters of rivers, production of carp, comparison of the growth rate of four species of fish, a simple and efficient air compressor for aquarium tanks, and the control of undesirable aquatic plants.

SPAIN:
"La exportacion espanola de productos pesqueros. I--Consumo Interior y Comercio Exterior" (Spanish Export of Fisheries Products. I--Domestic Consumption and Foreign Trade), by V. Paz-Andrade, article, Industrias Pesqueras, vol. 36, no. 851, October 1, 1961, pp. 336-337, printed in Spanish, single copy 10 ptas. (about 17 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2°, Vigo, Spain.

"A producao pesqueira espanhola e a exportacao de conservas de peixe em 1961" (The Spanish Fishery Production and the Export of Canned Fish in 1961), article, Conservas de Peixe, vol. 17, no. 199, October 1962, pp. 20-22, printed in Portuguese. Conservas de Peixe, 68 Reguairao dos Anjos, Lisbon, Portugal.

SPEARFISH:
Description and Relationships of the Longbill Spearfish, TETRAPTURUS BELONE, Based on Western North Atlantic Specimens, by C. Richard Robins and Donald P. De Sylva, Contribution No. 287, 31 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 10, no. 4, December 1960, pp. 383-413.) Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

SPINY LOBSTERS:
The Western Australian Crayfishery, 1944-1961, by Keith Sheard, 107 pp., illus., printed. Keith Sheard, 19 Webster St., Nedlands, Western Australia, 1962. Discusses in detail the development of the spiny lobster (Panulirus longipes) fishery, 1944-1961; open seasons in various areas and condition of the fishery, by months; State and Commonwealth regulations; spiny lobster behavior and fishing practice; the commercial fishery in various areas, 1944-1961; the export catch; growth and age-grouping; and fishery management. Accompanying tables and figures present data showing the development of the spiny lobster fishery from a commercial catch of 600,000 pounds in 1944/45 to 19,200 pounds in 1959/60. During that period, the number of men engaged in the fishery rose from 42 to 1,173. The value of the catch to the State increased from about £25,000 (US$70,000) to £4,000,000 ($11,200,000). Between 90 and 95 percent of the catch is sold as frozen tails on the United States market.

SPORTFISH:
Standard Check List of Common Names for Principal American Sport Fishes, 27 pp., printed, 8 cents. Headquarters, Outdoor Writers Association of America, 10 E. Lafayette St., Baltimore 2, Md., 1962. A list of the common and scientific names of the principal sportfish in the United States. The names of the fish are grouped under fresh-water and salt-water classifications.

SQUID:
"Respiratory and Swimming Movements in the Cephalopod Cranchia scabra," by Malcolm R. Clarke, article, Nature, vol. 196, no. 4852, October 27, 1962, pp. 351-352, illus., printed, 3s. (about 42 U. S. cents). Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

SURGEONFISH:
A New Species of Acanthurus from the Caroline Islands, with Notes on the Systematics of Other Indo-Pacific Surgeonfishes, by John Ernest Randall, Contribution No. 268, 14 pp., illus., printed. (Reprinted from Pacific Science, July 1960, pp. 266-279.) Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

SWORDFISH:
"Svardfisken--havens raskinn (Swordfish--Fighter of the Sea), by Erik Hallstrom, article, Svenska Vastkust Fiskaren, vol. 32, no. 16, August 25, 1962, pp. 360-361, illus., printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Goteborg, Sweden.

TRADE LISTS:
The Bureau of International Business Operations, U. S. Department of Commerce, has published the following mimeographed trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., or from Department of Commerce field offices at $1 each.

Canneries and Frozen Foods--Producers and Exporters--Hong Kong, 6 pp., September 1962. Lists names and addresses, size of firms, and types of products (including fish and shellfish) handled by each firm.

TRAWL FISHING:
"The Oregon Trawl Fishery for Mink Food--1948-1957," by Walter G. Jones and George Y. Harry, Jr. (Bureau of Commercial Fisheries, Ann Arbor, Michigan), article, Oregon Fish Commission Research Briefs, vol. 8, no. 1, 1961, pp. 14-30, printed. Fish Commission of Oregon, 307 State Street Office Building, 1400 SW. 5th Avenue, Portland 1, Oregon.

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TROPICAL FISH:
Encyclopedia of Tropical Fishes, with Special Emphasis on Techniques of Breeding, by Herbert R. Axelrod and William Vorderwinkler, 763 pp., illus., printed. Sterling Publishing Co., Inc., 122 E. 25th St., New York 16, N. Y., 1961.

TROUT:
Some Morphological Characters of Trout from Lake Mavrovo and the River Radika, by M. Sidorovski, OTS 60-21648, 14 pp., illus., printed, 50 cents. (Translated from the Macedonian, Izdanja (Skopje), vol. 1, no. 5, 1955, pp. 135-147.) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1962.

TUNA:
"Studies on the Green Meat of Albacore and Yellowfin Tuna," by Yuichi Sasano and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, June 1961, pp. 586-592, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

"Tuna Larva," by M. Watson, article, Oceanus, vol. 9, no. 1, September 1962, p. 19, illus., printed. The Woods Hole Oceanographic Institution, Woods Hole, Mass. The larvae of the six species of tuna appear identical but have been distinguished from one another, by previous investigators, on the basis of differences in pigmentation. The present study found pigmentation such a variable characteristic that precise identification was untenable. Thus a new method was developed by using the soft x-ray technique. Medical equipment was used to photograph the vertebral characteristics of four of the five western Atlantic species of larval tuna. Now certain identification became possible for the first time.

TYRRHENIAN SEA:
"Rapport sur les recherches oceanographiques faites en Nord Tyrrhenienne en fevrier 1960" (Report on Oceanographic Research Conducted in the North Tyrrhenian in February 1960), by Jean Le Floch, article, Travaux du Centre de Recherches et d'Etudes Oceanographiques, vol. 4, no. 4, May 1962, pp. 45-63, illus., printed in French. Centre de Recherches et d'Etudes Oceanographiques, 1, Quai Branley, Prais (7e), France.

UNDER-THE-ICE FISHING:
Mechanization of Under-the-Ice Fishing, by N. S. Fershtut and B. S. Torban, T. 129, 4 pp., processed. (Translated from the Russian, Rybnoe Khoziaistvo, no. 3, 1953, pp. 21-24.) University of Melbourne, Languages Section, Faculty of Science, Parkville, N2, Victoria, Australia.

VIRGINIA:
A Revised Preliminary Check List of the Invertebrate Fauna of Marine and Brackish Waters of Virginia, by Marvin L. Wass, Special Scientific Report No. 24, 1 vol., printed. Virginia Institute of Marine Science, Gloucester Point, Va., 1961.

VITAMIN A:
"Studies on the Economical Manufacture of Vitamin A Concentrate from Fish Liver Oil. XI--Esterification of Vitamin A Concentrate. 3--Divitamin A Esters of Phthalic Acids," by Toyosuke Kinumaki, article. Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, March 1961, pp. 261-281, illus., printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

WHALES:
Whales, by E. J. Slijper, 475 pp., illus., printed, 63s. (about US$8.85). Hutchinson and Co., Ltd., 11 Stratford Pl., London W1, England, 1962.

YUGOSLAVIA:
Licensing and Exchange Controls--Yugoslavia, WTIS Part 2, Operations Report No. 62-61, 4 pp., printed, 10 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., October 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers Yugoslav import, export, and foreign exchange controls; United States import and export controls; and other related information.

Created in 1849, the Department of the Interior--America's Department of Natural Resources--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

TOPSY TURVY TUNA PIE

Lent is the time to let your table sing with seafoods. With the approach of this religious season, fresh, frozen and canned seafoods in myriad forms smile at the variety-minded consumer from shelves, freezers, and beds of freshly-crushed ice.

Conventional cornbread bolstered nutritionally with protein-rich tuna and gayly decked with lemon or orange slices flips to gain the favor of the discriminating homemaker during the Lenten season.

- 1 can (6½ or 7 ounces each) tuna
- 2 tablespoons chopped onion
- 1 tablespoon tuna oil
- 1 can (10½ ounces) condensed cream of mushroom soup
- 2 eggs, beaten
- ½ cup fresh bread crumbs
- 6 thin slices lemon or orange
- 1 package (12 ounces) cornbread or corn muffin mix

Drain tuna, reserving oil. Flake tuna. Cook onion in oil until tender. Add soup, egg, bread crumbs, and tuna; mix well. Arrange lemon or orange slices on the bottom of a well-greased 10-inch pie pan. Pour tuna mixture over fruit slices. Prepare cornbread mix as directed on package. Spread batter over tuna mixture. Bake in a hot oven, 400° F., for 25 to 30 minutes or until brown. Remove from oven and let stand for 10 minutes. Loosen from sides of pan with a spatula and invert onto serving plate. Serves 6.

Versatile seafoods are rushed daily from seines to supermarkets and from harbors to households; with these quality products the imaginative consumer can let her culinary creativeness run rampant. Flexible fillets, savory steaks, palatable portions, convenient canned fish and tang-o-the-sea shellfish await her selection at nearby stores.

Not only do seafoods appear in endless shapes and sizes, but they lend themselves to countless methods of preparation. Steaks or salads, chowders or canapes, soups or sandwiches; broiled, baked, fried or flaked; breakfast, brunch, dinner or lunch--seafoods satisfy.

The New Orleans Mardi Gras which precedes the Lenten season is internationally famous for its great show of imagination. With the imagination and her own special touch, the American housewife can let the sparkle of Mardi Gras linger on her table throughout the Lenten season.

--From Fisheries Marketing Bulletin: "Let the Sparkle of Mardi Gras--Linger on Your Table Throughout the Lenten Season." Issued by the National Marketing Services Office, U. S. Bureau of Commercial Fisheries, Chicago 5, Ill.